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THE TREATMENT OF FRACTURES

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INTRODUCTORY.

Several fatalities have been reported by experienced surgeons, following the open method of treatment of fractures. The procedure is, therefore, worthy of careful deliberation. Let us, then, pause for a moment, first to consider the merits of the closed method: Based upon the observation of a large number of cases, in which the open and the closed methods of treatment have been contrasted in order to arrive at some definite conclusion—cases as far as possible of like character and severity, involving corresponding bones and treated as far as possible under the same circumstances otherwise, I am of the opinion that the closed fracture *in cases in which it can be properly kept as such*, always unites more quickly than the closed fracture treated by the open method. This has been unquestionably true in several cases of closed double fractures, notably one very severe trauma involving both the long bones of both legs caused by the fall of a steel beam upon the crossed legs of the patient who, at the time of the accident, was sitting on the floor of a building under construction. The x-ray showed strikingly similar comminuted fractures of both bones of both legs. One leg was treated by the closed method, the other by the open method and plating, with the result that the closed fractures were consolidated four weeks before the corresponding bones treated by the open method. This was the nearest approach in my own experience to the logical conditions and requirements necessary to form any accurate idea as to the relative value of the two methods of treatment. It is reasonable to suppose that the additional trauma—although made under the strictest of aseptic precautions—of opening the tissues of one of these two limbs and the use of the steel plate therein was the direct cause of the difference in time of the consolidation of the bones of the two legs; in other words, that the trauma of operative pro-

cedure and the application of a foreign body are two of the chief factors in the production of delayed union. In the case cited, I could not suppose the delayed union due to muscular or fascial intervention, for I had taken deliberate pains to prevent this by securing an absolute anatomical reduction. And no one can doubt that anatomical reduction is one of the chief factors in quick repair and functional perfection. I am forced to believe, therefore, that the conservative treatment will, in many cases, yield results as good as, and often better than the radical method, and this in shorter time, in every case of approximate anatomical reduction, *in which it is possible to secure it*. Even in cases of rapid union following operative procedure union would, I believe, be still more rapid in the same cases could the trauma of operations have been avoided.

Delayed or non-union is a frequent complication in fractures of the femur, humerus and tibia, especially those subjected to the open method of treatment, and more especially those in which foreign bodies, like steel plates, have been employed, whether blood clot and tissue fragments—commonly termed the stimulus for osteogenesis—have been removed or not.

Let us observe then, in passing, that operative intervention alone, without the employment of a foreign body, may retard bony union. Indeed, delayed union or non-union following operative procedure is even more common in fractures of the femur than in those of the tibia, simply because of the greater trauma necessary in the former—a larger bone, a deeper wound, a greater disturbance of tissues. If this be true, and it certainly appears so, then the greater amount of foreign matter employed in fixation, because of the greater traumatism necessary therefore, the greater the dangers—not only of infection and of pressure necrosis, but also of delayed union or non-union, and for this reason a wire is better than a steel plate, and to use neither, when it is possible to avoid them, is better than to use either.

Mr. Lane holds that the steel plate hastens consolidation. This has not been my experience. On the contrary, excellent fixation though the plate makes, in many cases, indeed, it actually retards

consolidation, in cases, too, in which the soft structures have healed by first intention and presented not the slightest evidences of infection. Bony union of the femur, following ten weeks

in the hitherto motionless patient, without union, will simulate consolidation. We know, further,



Fig. 1. Gunshot wound of skull, 38 caliber pistol ball, bullet split in two fragments, one without the cranium, five scattered within the brain substance. (Probe placed against scalp to aid in localization.)

after steel plating, will probably be as far advanced in six or seven weeks in the absence of any foreign body whatever.



Fig. 2. This shows all fragments, as seen in Fig. 1, removed—an exact verification of the x-ray finding in Fig. 1, uneventful recovery of patient.

We know, on the other hand, that non-union is not a rarity in the closed fracture treated as such and in good apposition, a fact due some-



Fig. 3. Fracture of the surgical neck of the humerus, with marked displacement of fragments.

times to too active motion, sometimes to muscular intervention. And, by way of contrast, we may observe that a slight motion permitted



Fig. 4. The same as Fig. 3 reduced and wired.

that callus formation will progress in the presence of a mild infection, not because of it, but in spite of it; while infection of a severe grade



Fig. 5. Patient fell from wagon, striking arm on cobble stone, causing compound fracture of humeral shaft, with angular displacement through rotation of detached fragment.

will check callus formation altogether. And we are all agreed that sepsis is the greatest of all factors of failure in bone surgery.

The open method has a legitimate field of its own, however, viz., that in which coaptation can not be secured and maintained without it. But

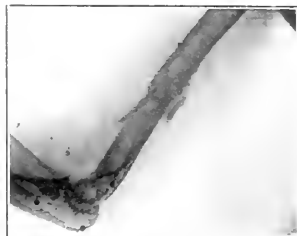


Fig. 6. The same as Fig. 5 reduced and wired.

I should like to join with those who protest against it as a procedure of routine. There are cases in which its propriety is unquestioned and

unquestionable; there are others in which equally good results are obtained by the closed method.

We should observe further that the difficulties in the treatment of fractures increase, as a rule, as the age of the patient increases. The child's case presents fewer difficulties than that of the young adult, and from the latter we may expect

phase of the subject to which I would now invite attention:

THE OPERATIVE TREATMENT OF FRACTURES.

The operative treatment of fractures may properly be considered under two headings: 1, Simple or closed fractures; 2, those which are compound or open. As between Lane and Fritz Koenig,



Fig. 7. Patient, female, sixty-five years old, fell down steps, causing fracture of the femoral neck.

much less anxiety than from a like condition in the aged.

The ideal treatment of fractures is that which effects, by the closed method and without recurrence of displacement, an anatomical reduction. The second best procedure is that of the open method by which reduction is secured and maintained without any foreign body whatever; the



Fig. 8. A transverse fracture of the patella, in which the fragments were widely separated.

on the one hand, advising operation in every case of simple fracture with considerable displacement of fragments and difficulty in holding them in apposition, and von Eiselsberg and the Viennese clinic, on the other, advocating surgical intervention only in fracture of the patella, we may regard both as extremes, and select the middle course, taking all the cases and all the



Fig. 9. The same as Fig. 7 reduced and fixed. The drill, preceded by the drill, passes obliquely, entirely along the length of the bone from the subtrochanteric point of fracture into the femoral head. Excellent functional result.

third, that which gives anatomical reduction, which is maintained with the least amount of foreign material for fixation. This last, however, is a wide and legitimate field for operative treatment, the condition being one, as we have observed, in which coaptation can not possibly be secured and maintained without it, and it is this



Fig. 10. The same as Fig. 8 reduced and fixed. The drill, preceded by the drill, passes obliquely, entirely along the length of the bone from the subtrochanteric point of fracture into the femoral head. Excellent functional result.

circumstances, as they occur, as being the safest, the safest, and the best guides. In experienced hands, however, with hospital facilities and a perfect aseptic technique, I should not hesitate to recommend the open operation where the fragments are widely displaced and apposition without operation is impossible. Under such circumstances the danger of infection is practically

nil, and that of anesthesia, in competent hands, unworthy of serious consideration.

What are the indications for operation in a closed fracture? 1. If complete reduction is impossible. 2. If a fragment or the soft parts intervene. 3. If the condition is a spiral fracture with much separation of the fragments. 4. If apposition cannot otherwise be maintained. 5.

to deal. The operation should not be undertaken except by those of considerable experience, and then only in the presence of an absolute asepsis. Under these favorable conditions, however, with ankylosis threatening, it is unquestionably best to cut down upon, replace and, preferably, suture the fragments.

What are the advantages of the open method?



Fig. 11. Gunshot fracture of fibula, four inches of bone destroyed, tibial and peroneal arteries severed; operation at first refused; gangrene, followed by supracandyloid amputation.

Multiple fractures, not too much comminuted. 6. Cases of rotation of the fragments. 7. Evidence of involvement of bloodvessels and nerves. 8. Marked deformity. Many of the most conservative men operate without hesitation upon the patella, the olecranon, and the os calcis.

In articular fractures, those just above the



Fig. 13. A closed fracture of both bones of the leg, caused by the patient getting caught under a falling embankment, and found impossible of satisfactory reduction. Treated as a closed fracture because of muscle intervention.

1. Better union; 2. Relief from pressure on nerves and bloodvessels; 3. Anatomically accurate apposition secured and maintained; 4. All interventions, whether bone, muscle, or periosteum removed and non-union therefrom prevented; 5. In articular fractures, whether the supraarticular,



Fig. 12. The same case as Fig. 11, showing molded stump and grafted patella in position, fixed by screws buried beneath fibro-periosteum and penetrating only dense bone. Patient can now (three months after operation) stand the weight of his body upon the firmly united graft without the slightest pain.

joint, those just below the joint, those into the joint, and in cases of epiphyseal separation—whether or not to operate is a nice question. Let us take the elbow joint for example. Any great displacement of fragments here is very apt to result in functional impairment if not in ankylosis. The problem in such cases is very difficult, perhaps the most difficult with which we have



Fig. 14. The same case as Fig. 13, cut down upon and reduced. Note the exact coaptation of the fragments and plaster-of-Paris cast. This is an instance of the second best procedure—that of the open method by which reduction is secured and maintained without any foreign body whatever.

infraarticular, circumarticular, or epiphyseal separation—there is vastly less danger of ankylosis.

After a fracture, when should we operate? It has been maintained that the best time is at the end of a week or ten days, the reason given being that then callus formation is most active, that blood clots and tissue shreds have begun to be absorbed. I believe in the earliest operation, if

operation is indicated at all. I believe further in washing out blood clots and tissue shreds and bringing the soft structures into the closest approximation to the bone, for elimination of dead spaces and for splint effect, rather than the reverse, and rather than imposing upon the system this unnecessary task of absorption, to say nothing of infection.

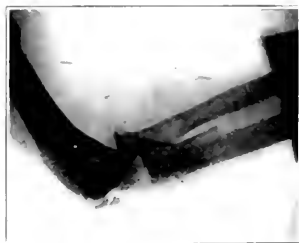


Fig. 15. A compound multiple fracture and dislocation at the elbow joint. Paster, a railroad employee, was struck on the elbow by a shifting engine.

How shall we treat compound fractures? It is most difficult to believe that it has been less than half a century since the surgeon had to choose between immediate amputations or death from infection; most difficult to realize that the mortality in such cases has fallen from forty and fifty per cent. to nine per cent., and even this is yearly growing less. Can the profession ever fittingly record its indebtedness to the immortals—Pasteur and Lister?

If the bone is extensively comminuted and irreparable damage to the main structures—vessels,

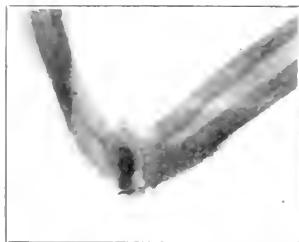


Fig. 16. The same as Fig. 15. Note the wiring of the comminuted olecranon process in fracture of the ulna. (10). Patient in acute flexion. Passive motion and massage were begun on the 14th day; functional result excellent.

nerves and muscles—exists, primary amputation is indicated and should be immediate if the patient's condition justifies it; if not, then we should ligate the main vessels, thoroughly cleanse the wound, apply an aseptic dressing, and await reaction.

If amputation is not indicated, it is well to observe the following precautions: 1. Thorough

disinfection of the wound surfaces, cutting away contaminated skin edges; 2. If suspicious of infection, irrigate with 1-1,000 bichloride of mercury solution, or with 70% alcohol or paint with tincture of iodine; 3. The fragments which project



Fig. 17. A spiral fracture of both bones of the leg, with very great displacement of fragments. Paster's ankle was caught in a revolving belt.

through the wound should be reduced; if necessary, resected; 4. If much displacement, suture the fragments; 5. Otherwise treat the open as you would the closed fracture.

Next, the wound itself should be cleansed of all freed particles of bone, dirt and blood clot. If it has been exposed to the dirt of the streets, hence to tetanus, it should be thoroughly irrigated and a prophylactic injection of antitetanic serum should be immediately administered. If



Fig. 18. Same as Fig. 17. Note the wiring of the

the wound is very large, after freshening the skin edges, they should be sutured and always drained. If small, we may dispense with sutures and leave the wound open for drainage.

Trendelenberg closes the wound completely after disinfection. The method is certainly to be condemned as a matter of course. Aseptic, occlusive, gauze and cotton-wool dressing. Extension, immobilization, the use of splints and

casts are similar to their application in a closed fracture. For immobilization the moulded plaster splint is excellent, or the circular plaster cast may be applied, split through the centre while yet soft, and a gauze bandage placed over this to prevent swelling on the one hand and pressure necrosis on the other.

If gas bacillus or gangrene is present, high am-

putation is the rule. If infection is apparent and it does not yield to the simpler methods, the wound should be freely opened and drained; or incision and counterincision made, followed by continuous irrigation with antiseptic solutions, such as bichloride of mercury, acetate of aluminum, 3½ per cent. tincture of iodine, 1-5,000

ence of infection or when they act as foreign bodies or when the x-ray finding shows that they admit of easy removal. A prophylactic injection of antitetanic serum is always timely in gunshot wounds, and if the lungs have been punctured, pneumonia is to be feared, hence vaccine therapy is indicated.

What are the best methods of fixation? Here opinions differ widely. Reposition is insufficient in many cases. To maintain accurate apposition mechanical fixation is necessary. The ideal suture is one that is strong enough to hold until

Fig. 20. Fracture of both bones of the leg; fixation of the tibia with the Lane plate. This plate weighed 410½ grains, while the tinned-steel-annealed wire used in Fig. 17 weighed but 8½ grains—actual apothecary weight.



silver nitrate; seventy per cent. alcohol; or the infected member may be treated locally with heat, 220° F., after the method of Clinton, of Buffalo.

Gunshot fractures are treated like any other compound fractures. The surrounding skin should be immediately and thoroughly disinfected. Beyond this, in most cases, the more conservative the treatment, the better the results. If there

Fig. 21. The same as Fig. 20 reduced and placed in plaster-of-Paris cast.

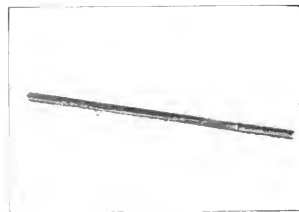


Fig. 22. Author's grooved bone drill. The darker shadow represents the groove. Attached to the flexible shaft of a motor, with cord and fitting for the electric lamp socket, this instrument drills a hole in a few seconds after exact coaptation of the fragments. The wire is then passed through the groove in the drill and the drill withdrawn, leaving the wire for fixation of the fragments and maintaining them in the exact coaptation of reduction. The fragments cannot slip after reduction, for the drill holds them immovably until the wire makes them fast. The operation by the old solid drill, by hand method—uncertain, tedious, slow—is thus rendered certain, simple, and only a matter of a few seconds.

union has taken place and then to admit of its own absorption. Unfortunately we have nothing as yet that can with safety be relied on for this

purpose. The nearest approach to it is the sixty day chronic catgut or kangaroo tendon. The non-absorbable sutures most used are of silver, iron, or bronze aluminum wire. In addition may be mentioned screws, nails, clamps, clips, ivory pegs, etc. In cases of little tension, as in epiphyseal separations at the elbow, the epicondyles of the humerus, fractures of the clavicle, olecranon, patella, tuberosity of the os calcis, the absorbable sutures may be risked.

When there is tension, the best suture is of wire, either a single heavy or a double fine thread. Silver is objectionable because it readily breaks with the twisting of the knot. Bronze aluminum or iron wire has greater tensile strength. For five years past I have been using a tinned-steel-annealed wire, which is the strongest and best of them all.

The method of application of the wire is very important. We may drill openings through the medulla and entire diameter of the bone and, after approximating, twist the suture. We may dispense with the drill and surround the entire circumference of the bone once or several times with the suture and thus hold the fragments together. Necrosis here is an exaggerated fear. We may pass the suture through the periosteum only, as in the patella or olecranon. We may pass through the cortex and into the medullary cavity of each fragment and on one or both sides as desired. Or we may pass partially through the cortex, between the periosteum and medullary cavity, without entering the canal at all. This is perhaps the best method for long bones, for oblique and spiral fractures, and altogether the best method for every bone to which it may be applicable. Lane recommends steel plates and screws, Parkhill recommends clamps. To all such devices the objection has been very properly raised that they are bulky, heavy, cumbersome, of unnecessary size and weight, which increase the dangers of all foreign bodies with an added danger of pressure necrosis and infection.

The use of plates and clamps is growing less and less every year. The weights of the smallest and lightest Lane plate and that of the smallest wire necessary to hold the same fragments in correct apposition are thirty-four and a half grains as compared to one and three-eighths grains; and the weights of the largest Lane plate and of the largest tinned-steel-annealed wire to accomplish the same purpose, are 594.5 grains as compared to fourteen and a quarter grains—actual apothecary weight.

CONCLUSIONS.

The closed method is the method of choice when even an approximately anatomical coaptation can be secured. On the other hand, operation is indicated in the closed fracture of wide displacement and when correct apposition is otherwise impossible, provided hospital facilities can be obtained.

Operation is indicated in articular fractures when ankylosis threatens, and the best results are obtained after exact coaptation and suturing of the fragments. Massage, followed by early passive motion, gradually made active, should be the practice.

When operation is indicated at all, the earliest operation is the best.

The operative treatment for open fractures is that which most nearly reduces them to the type of the closed fracture, except as to drainage.

Gunshot fractures should be treated like fractures of the open type in contact with street dust. That is to say, in addition to the usual treatment we should administer, as a wise precautionary measure, antitetanic serum.

In all cases the most exact coaptation and retention of the fragments gives the most gratifying results.

The ideal suture is one strong enough to hold until union begins and then admits of its own absorption. The nearest approach to this is the sixty-day chromized catgut, which is unsafe and unsatisfactory in the presence of tension. The most trustworthy metal suture is the tinned-steel-annealed wire. Wiring is the best method of fixation in the great majority of cases.

Because of the dangers of an osteomyelitis the secondary canal should not be invaded if it is possible to avoid it.

The illustrations represent some of the most common as well as some of the most interesting fractures which the writer has had to treat. For radiographing these cases the author is indebted to Dr. Thomas A. Grover.

THE FRACTURE

The important considerations in the treatment of fractures are, at first, relief of pain and reduction of swelling, and subsequently, preservation of function of the member, the bones and the neighboring parts. Hence the value of early and frequent massage and passive motion, and in suitable cases, of active motion and the necessity for adding splints that unduly compress the muscles or deprive them of activity.

DEDUCTIONS FROM OUR EXPERIENCE
AT THE HOSPITAL OF THE GOOD
SHEPHERD IN THE OPEN
TREATMENT OF FRACTURES.

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The experience obtained on the service at our hospital in the open treatment of simple fractures covers a period of twelve years. We feel that this experience, though not large, has been sufficient to justify us in definite conclusions.

Our work, to its present extent, agrees with the findings and injunctions of both the English and American Committees appointed by their respective Surgical Associations to formulate rules to govern the use of the open method treatment in simple fractures. I should like here to call attention to the essential difference in the reports of these two committees. The rules of the English Committee require the surgeon to be experienced and to have suitable facilities for aseptic technic. They disallow the use of the open treatment where reduction can be made without incision. They point to more satisfactory results when undertaken immediately after accident; regard it as commonly unnecessary in childhood because the deformities of early life, resulting from imperfect reduction of fracture, largely disappear with increasing age; and because of its frequent failures, warn against its use in the treatment of old ununited fractures.

The American Committee, on the other hand, in their preliminary report at Washington, before the American Surgical Society in May, 1913, in the first place classified those employing the method of the open treatment in three groups, and then formulated rules appropriate to each of these three classes.

Operators are classified by this Committee as follows: 1. Those inexperienced in the technic and special requirements of open operation; 2. Experienced surgeons, but with poor or only average hospital facilities at their command; 3. Competent surgeons, who have at their command excellent hospital and operating-room facilities, and also have assistants carefully and thoroughly trained in all the details of aseptic procedures. It was only to the last of these groups that the Committee gave sanction for the frequent and free use of the open method. The

first class were barred absolutely, and the second also, except when some peculiarly urgent necessity for the method should exist.

Herein is recognized and emphasized the keynote to the success of these operations: perfect aseptic technic. Success comes only through the association of the experienced surgeon, a properly equipped and conducted operating-room, and trained assistants. The markedly great value of thoroughly trained assistants is nowhere more apparent than when the surgeon undertakes procedures that depend for their success on absolute asepsis. In unusual or new procedures that the surgeon may undertake, however dexterous he may be in his own performance, he cannot completely control the untrained assistant whose enthusiasm represents his curiosity rather than his eagerness to contribute to success.

The evils that come from inexperienced and inadequately trained assistants are in constant evidence in every hospital where internes recently graduated from college and frequently changing, assume the role of surgical assistants. In operations such as this under consideration where asepsis is absolutely essential, the assistants should be selected because of their adaptability, previous training and intelligent apprehension of their duties. We have found for such operations success better assured by the use of only one assistant properly trained even if some time is lost and the operative procedure rendered a little more difficult, than of more, some of whom are known to be lacking in the prerequisite experience and ability.

I emphasize this particularly because in a recent book on the principles of surgery just received for review, in referring to open methods of treatment of fractures it says: "It is the method of choice in fractures of the larger bone and can be done *easily* and *safely* by *any one acquainted* with his anatomy and with aseptic methods." I have used italics in the above quotation to call attention to a statement which is to be deplored.

At first the open method of treating fractures was employed almost solely for the purpose of holding in apposition the fragments that could not be kept in place by the use of splints and extensions. For this purpose foreign material such as silver wire was employed, then Lane's plates came into use. Here was a great advance. Through the experience and knowledge gained in these operations we gradually came to an appreciation of the true causes of our inability by the older method to properly reduce fractures

and to keep the fragments in good apposition. Instead of muscle pull and muscle contractions being the primary faults, they are secondary complications and cause the deformity because of the imperfect position of the fragments. By open incision we found the failure to accomplish reduction was most always due to the interposition of extraneous tissues, as fascia and muscle, and the inability to apply splints and extension so as to prevent overriding and deformity was due to the failure to first properly reduce the fracture. By the removal of the hindrances to apposition, reduction of fragments and their permanent retention in place became possible. It was the imperfect reduction and not the muscle contraction that was responsible for the failure of outside splints and extension. Suture of the periosteum and surrounding tissues is often sufficient to insure against redisplacement; or, if the plane of fracture is unfortunate, kangaroo tendons wound around the fragments or passed through drill holes may assure the fixation. From this we have come to the conclusion that each case submitted to operation should still be carefully considered after complete reduction through incision before resorting to the use of a plate or bone implantation as well. We believe that in many cases after the fragments have been successfully put into apposition through open incision, outside splints and other simple means will suffice to hold them in place. Relieved of the necessity of introducing a non-absorbable foreign body, we eliminate the most dangerous element in these procedures. So many and great are the objections to the use of plates that we have given them up entirely. In our experience the necessity of subsequent removal of plates for all causes has been in 75% of the cases, and this per cent. in the old cases grows as time goes on.

The use of plates instead of wire was introduced in fracture treatment to secure absolute immobility of the fragments. In spite of the advantages gained in the ambulatory treatment of fractures apparently through the stimulation to greater bony growth at the point from the irritation caused by the slight motion induced, absolute immobility is of real advantage. It is the early functional use of the limb as a whole, and not irritation by movement, that is of importance. The use of plates, especially metal plates, necessitates more delay in returning to the normal use of a part because of the danger of the bending of the plate and the possibility of the strain loosening the screws. When these accidents occur removal of the plate becomes

necessary. Good early bone union is therefore delayed or necessary through the prolonged restraint when plates are used and this is sometimes the real cause of non-union. I cannot escape the conclusion that bone atrophy, as shown by the x-ray following fracture, like the atrophy of muscles, is due to disuse of a limb, and to this in turn is due in large measure poor and delayed bony union. We have come to employ very early, as soon as the active signs of inflammation have subsided, passive motion and moderate pressure in the bearing strain line, and we begin active motion correspondingly early. It is hard to say just when, as each case is a law to itself, but active use is usually permitted from the twelfth to the twenty-fourth day. If the radiograph and manual examination do not show satisfactory progress in healing, thyroid extract is prescribed. We are convinced of the usefulness of this remedy to stimulate the formation of callus. The injection of iodine at the seat of fracture is also to be recommended. Bier's injection of the patient's blood between the bone ends, though new to us, seems scientifically proper. His good results from this method of treatment coincides with our theory of the explanation of why open operations undertaken immediately or very soon after the injury are more successful than are those done some time after the time of injury. A blood clot between the fractured ends is essential to proper bony union. In the operation it is the practice to carefully remove all old blood clots and unless the break is recent or the end freshened by recutting, there will not be formed a new blood clot from hemorrhage.

Our theory respecting the part played by the blood clot may be expressed as follows: specialized tissue structures other than connective tissue require a definite space or channel for their growth. For example, regeneration of nerve occurs only when the divided nerve ends have been brought in apposition, or, if too far separated, the tract between them is kept open by a tube or if not by an actual tube by some material that is absorbable which by the proliferation of the surrounding and en-sheathing connective tissue accomplishes the same end. A blood clot acts in this same way by organizing and then allowing any specialized adjacent tissue to replace it or proliferate itself into it. On the other hand, connective tissue formation derived from any tissue other than the bone, that is to say, growing in between the ends of the bone from the surrounding tissue will remain simple con-

nective tissue or organized to its specialization, but will not become osseous. The periosteum of the bones themselves seems to act in this capacity as a sheath for proper bony growth within, rather than to be actually engaged in the formation of osseous tissue.

Through the routine and early x-ray examination after each attempt to reduce a fracture by manipulation, we have frequently observed where complete reduction has not been obtained that greater deformity and greater displacement was the result. This is due to the fact that displaced fragments are retracted by muscular contraction until they become fixed in the adjacent soft tissues. Each time that manipulation is performed the pocket in these tissues is torn and loosened, and if the end or ends are not properly apposed, mechanical restraint will not be successful and they will slip back into the enlarged pocket. This results in greater displacement. This offers a good reason for the open operation. If for any reason operation is not admissible in a given case, manipulation for reduction should be very carefully considered and the patient should be made aware that if unsuccessful greater deformity will probably be the result. On the other hand, if open operation is permissible and complete reduction is not obtained by manipulation as shown by physical and x-ray examination, 24 to 48 hours later, open operation is urgently indicated.

CONCLUSION. We hold that the open treatment of fractures is more scientific and gives more satisfactory results than the older method in those cases where complete reduction cannot be immediately accomplished and maintained; that the dangers of open treatment lie only in faulty technique; that excepting where it is necessary to bridge in a gap, foreign material other than sutures should not be introduced; that when such foreign material is necessary bone from the patient himself is best; that all cases should be examined at regular intervals with the x-ray to determine the amount and extent of callus formation, and when failure in such formation is manifest in spite of early manipulation, strain pressure and massage, known therapeutical and mechanical means to induce local hyperemia and promote bony deposits should be employed.

Fractures of the metatarsal bones may be produced by slight injuries. Thus, the base of the fifth metatarsal may be fractured by a twist of the foot while walking or dancing.

CONSERVATION IN THE TREATMENT OF FRACTURES.

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Conservation in the treatment of fractures must take into consideration not only how best to restore the continuity of the bone involved but also how to do it with as little suffering and inconvenience of the patient as possible, and with the shortest possible period of disability, and with the best final result.

Therefore in beginning the treatment of every fracture the surgeon should consider,

- 1st. What is the best treatment for this particular bone, considered as regards (a) the individuality and physical condition of the patient, (b) the environment of the patient, (c) the actual fracture itself.
- 2nd. What method of treatment will give the patient the least suffering and discomfort after reduction and fixation.
- 3rd. Which will be the method most likely to result in the shortest disability of the patient and give him afterwards the best final functional result.

First, What is the best treatment for this particular fracture considered as regards:

- (a) *The individuality and physical condition of the patient.*
- (b) *The environment of the patient.*
- (c) *The nature, location and condition of the fracture itself.*

(a) Before everything else I have advisedly placed the consideration of the *patient himself*. That is to say, the determination, if possible, not only of the actual physical condition of the individual as regards his general health and his reaction to the trauma, the amount and degree of local injury, but also his temperamental peculiarities and habits.

It would obviously be highly improper to treat a very old or a very young patient as one would a young adult; or a very weak and organically diseased person, as one would a strong, healthy individual.

The first thing to do, therefore, in beginning the treatment is to make a careful general physical examination of the patient. Note all organic lesions and evidences of improper or delayed development, or marked signs of senility.

Old people, whether senile from the degeneration of very many years or the effect of some dyscrasia, notoriously are intolerant of confinement to bed and all that it means.

Conservation requires therefore that this class of patients shall be treated by some method which will

free them from the bed very soon, immediately if possible.

Again, old people as a rule do not endure severe operative procedures and all that may follow severe operations. Open methods are not the methods of selection for the treatment of fractures in this class of patients.

One is almost of a necessity brought to the selection of some fixed dressings which may enable the patient to be taken out of bed, and which will so control the affected limb while he is out of bed that no great or persistent suffering will result.

The bones of very old persons unite very slowly, if at all, their soft tissues are rigid, even fibrous tissue is very slow to develop between the ends of the fragments. The fractured ends become encysted in a cavity formed by the deep muscles, fascia and extravasated blood clot—in many instances, without any attempt at union or callus; rather, atrophy takes place. The result is very considerable mobility of the fragments, and until the cyst cavity is formed laceration of the muscles and fascia takes place whenever motion occurs. Result: pain, restlessness, lack of sleep, rapid loss of flesh and strength. Immediate fixation is therefore necessary but it should be *by light molded splints*.

These cases cannot endure irritating pressure nor do they tolerate very heavy apparatus. Well-fitting molded splints of leather reinforced by light (aluminum) metallic strips or bars, I have found best in these cases.

Young children always do best with fixed molded splints. Plaster of Paris makes the ideal dressing for them.

The disposition of the patient should also influence the choice of method of treatment and the selection of splints. Nervous, very irritable people do not tolerate long periods of extension by the ordinary methods of traction usually employed, nor do they endure confinement to bed as well as calm and phlegmatic individuals do.

Especially must one take into consideration the systematic effect of the trauma in selecting and applying methods of treatment. A fracture of one of the chief long bones sometimes produces very severe shock. The injury is always exceedingly painful. The "nocturnal association" of Crile intensifies and sometimes prolongs this shock for many hours. Therefore to set about prolonged efforts at reduction of the fracture or the application of apparatus which itself will be painful, during this period, would be very bad for the patient and extremely bad judgment on the part of the surgeon.

The extremity should, with the utmost gentleness,

simply be fixed in the position of deformity by some temporary splint or dressing (for the lower extremity an old fashioned fracture box, or sand bags serve best) until full reaction takes place, then the formal reduction may be made and the permanent dressing applied.

This injunction in regard to these conditions of extreme weakness and suffering from the fracture seems so elementary and trite that I would not think it necessary to emphasize it but for the fact that I have very frequently seen physicians forget or neglect to observe it. Not only do "green internes" in hospitals forget it, but physicians of experience who ought to know better neglect it.

In an investigation of 788 cases of fracture of the shaft of the femur, I found that of the 27 deaths reported, 5, or over 22% of all the deaths, occurred from shock and exhaustion.

Illnesses of whatever kind, dyscrasias and specific infections must of course receive consideration and will markedly modify the treatment.

(b) *Environment.*

The surroundings, housing and etc., must have very great influence in the selection of treatment for fractures. These markedly influence the result of treatment too.

One should hesitate to criticize the result in any given case of fracture until he knows the surroundings and conditions with which the attending physician had to work.

Very different methods must be employed in treating a fracture of the femur, say in a remote country house, having only the old-fashioned broad beds and usual furnishings and means of a house of a small farmer, from those employed in a first-class hospital or in the modern home of a rich city dweller.

Notwithstanding the exaggerations and positive errors of skiagraphs taken by ignorant or unskilful persons, it is nevertheless a fact that a skiagraph properly taken by a competent operator serves as the best guide to determine the relative positions of the fragments in cases of fractures, and is the best record of proper or improper adjustment of the fracture. Therefore a physician who is obliged to treat a fracture without the advantage of an x-ray machine should have his results judged by a different standard than those of a surgeon able to use the advantage of a well equipped x-ray laboratory. This fact it seems to me ought to be brought out very prominently in medico-legal investigations and in suits for malpractice.

(c) *The nature, location and condition of the fracture itself.*

A thorough examination of a fracture should

be made only when the surgeon is prepared to apply the necessary fixation apparatus after reducing the fracture.

To obtain a proper idea of the position of the fracture, the nature of the fracture, and the displacements of the fragments requires manipulations which cause very sharp pains and it is an exhausting process for a nervous and very sensitive person. Unless it be necessary in a consultation or for some other well defined purpose which concerns the well-being of the patient it is not necessary in the preliminary examination for the purpose of giving first aid and applying temporary dressings to make the patient endure the agony of a thorough examination for the purpose of making an accurate determination of the nature and position of the fracture. This is all the more to be avoided if the patient is to be transported some distance.

The injured limb should be fixed *in the position of displacement*, after ascertaining that the ends of the fragments are not so located that they will be apt to injure the skin or large bloodvessels or nerves. The patient should be carried to the place where he will receive permanent treatment; *then* a careful examination should be made but with the utmost gentleness and care. Rough and inconsiderate handling always exaggerates the pain and the apprehension of the patient, this in turn provokes spasm of the muscles of the injured member and renders examination and reduction much more difficult. Having determined the fracture and displacement, immediately the proper splints and fixation apparatus should be prepared. These splints, etc., should be selected for each individual case and should be adapted to the case in hand in every instance. That is to say, a case of fracture of the middle of the shaft of the femur, for instance, should not have applied to it doctor A. B. or C.'s splint for mid-thigh fractures, or the latest recommendation for extension apparatus for fractures of the middle of the femur simply because these have been recommended as most efficient in such cases by their distinguished and experienced advocates.

Every case of fracture differs as much from every other case of fracture of similar location as do cases of pneumonia which involve similar areas of the lung in different individuals.

In short, the fixation apparatus must be adapted to the individual case, and not the individual case to the apparatus.

I have the greatest difficulty in making my internes and assistants grasp the full importance of this maxim. Hence, I emphasize it on all occasions and opportunities, as I believe physicians generally

may also not be thoroughly impressed with the vital importance of it.

It is of the greatest importance, therefore, that an accurate determination or diagnosis be made of the direction of the fracture, as regards the axis of the bone, viz., whether transverse, oblique, longitudinal or spiral; the displacement of the fragments and their relative positions as regards the longitudinal and transverse axis of the limb, and whether the fracture is simple, comminuted, multiple or complicated, and whether the fracture is complete, green stick or impacted. It goes without saying that it is most important also at once to diagnose a compound fracture. While this usually is easy, in a few cases it will be very difficult to determine. Sometimes small lacerated wounds of the skin and fascia seem not to involve the soft tissues to the bone when actually by devious routes they do. *When in doubt treat such cases as compound fractures.*

To determine all these points, manipulation and palpation for an experienced surgeon may suffice for a fair degree of accuracy, but for the family practitioner and the occasional handler of fractures it will be far better to have a skiagram made by a reliable Roentgenologist. Indeed I think no surgeon now-a-days ought to treat a fracture of an important long bone without the benefit of a skiagram.

Careful measurements should be made, though it is well known that extremities, especially the lower extremity, vary very considerably in length and development in their normal condition. Careful inspection of the fellow-member should also never be neglected, if it has not been injured, to determine the proper contour and direction of the limb and in order accurately to gauge the distortion of the fractured extremity.

In many instances it will be necessary to employ general anesthesia to make a thorough diagnosis. As this will be necessary in most cases in order to "set" the fracture a surgeon should always be prepared to use ether when called to care for a fracture.

Having accurately diagnosed the nature and condition of the fracture and having everything ready for the reduction the surgeon must decide what, under the circumstances, will be the best treatment for the individual case. This sometimes will be comparatively easy; at other times it will be extremely difficult.

I have been obliged to try in some cases several methods before I found the treatment and apparatus which seemed to fit the conditions of these cases.

General anesthesia, unless there be some contra-indication, should be employed in reducing nearly

all the major fractures. Indeed, in very few cases is it possible to reduce the fracture without the relaxation and freedom from pain which narcosis procures.

Transverse fractures of the long bones, when accurately reduced, may confidently be placed in a rigid molded splint. Plaster of Paris I have found quickest and best for making these splints.

Fractures having a short obliquity with deep notches or "shoulders," also may be treated by plaster of Paris splints when accurately reduced.

Very oblique fractures with comparatively smooth beveling along their fractured surfaces require, as a rule, continuous extension with lateral coaptation devices, at least for a time.

Fractures about the joints require special positions of the distal fragment in order to meet the usual tilting of the proximal ends. It is impossible to state just what position this may require. Each case, as I said before, varies from all others. Anatomical laws do not apply in many cases of fracture. Varying degrees of injury to the adjacent and attached muscles will entirely prevent, in some cases, the normal traction of the muscles, and the spasm of the muscles which is provoked by the irritation of the fragments will in other cases make distortions quite contrary to the anatomical rule for the cases.

It is therefore a matter of paramount importance to know the relative position of the fragments in every case. Knowing this the proper position may be determined for the individual case.

It may be noted that the statement was made if accurate adjustment of the fragments can be made in certain fractures they may be held by fixed rigid plaster of Paris dressing, properly applied. As a matter of fact, *accurate adjustment of the fragments is practically never obtained by the old conservative methods.* This is not hard to understand and to forgive after one has in many instances seen, by the open method, the fragments entangled in the fascia and muscles, and noted how tremendously difficult it is to unite them even while seeing and handling them by direct traction and leverage of powerful instruments through the open wound.

Then, too, no outside splint or traction device is absolutely reliable. I am convinced, after studying a large number of skiagrams of my own and other surgeons' cases, that reposition of fragments by the accepted methods of traction, viz., Buck's extension and all its variations, Bardenheuer's method (Steinmann's traction hooks have not been used long enough yet to report accurately on them), and the assistance of coaptation splints and devices is *very rarely accurate.*

Properly fitting plaster of Paris splints will hold the fragments and the limb, *if reduction has been made and maintained during the application of the splint.* Unfortunately this, also, is very rarely obtained.

One is brought, therefore, face to face with the alternative of inaccurate adjustments of the fragments and doubtful maintenance of reposition with such results as were formerly obtained, or the employment of the open operation for the adjustment and direct fixation of the fragments, with the risk of infection, etc. Which shall it be?

Lane and his immediate followers and the report of the Committee on Fractures of the British Medical Association (1912 meeting) have given a tremendous boost to the open method treatment of fractures of the long bones.

The Committee of the British Medical Association based its report upon an analysis of 2,940 cases. The operated cases analyzed were only 208. It hardly seems fair to deduce fast conclusions as regards the relative advantages of the two methods from such a disproportionate number of cases. Again, it must be taken into consideration that the operated cases were taken from the clinics of the best equipped and skilled surgeons whereas the non-operative cases were gathered from a much larger and probably more representative list of practitioners.

Summarized, condensed and the order changed the most important conclusions were as follows:—

1st. Although the functional result may be good with an indifferent anatomical result, the most certain way of obtaining a good functional result is to secure a good anatomical result.

(See 1st. paragraph, p. 23 of the report.)

2nd. In nearly all age groups operative cases show a higher percentage of good results than non-operative cases. (1st paragraph, p. 23.)

3rd. No method, non-operative or operative, which does not promise a good anatomical result should be accepted as the method of choice.

Of operative methods those which secure accurate reposition and fixity of the fragments give better results than methods which do not obtain these.

4th. To secure the best results operative treatment should be resorted to as soon after the accident as practicable.

5th. The mortality directly due to operative treatment of simple fractures of the long bones is found so small that it can not be urged as a sufficient reason against operative treatment. (See table X, p. 23.)

6th. It is necessary to insist that the operative treatment of fractures requires special skill and ex-

perience and such facilities and surroundings as will insure asepsis.

7th. (This sums up the whole conclusion and should be carefully noted.) For surgeons and practitioners who are unable to avail themselves of the operative method, the non-operative procedures are likely to remain for some time yet the more safe and serviceable.

Robert Jones, commenting on this report in his presidential address, delivered at the Liverpool Medical Institution (*British Medical Journal*, December 7, 1912), also sums up the whole matter remarkably well in the following sentence.** "Before we reach to new things we must ask ourselves if we have done the best by the old; and it is only by being critics of our own work that we can discover, each for himself, which procedure will in his own hands give the best results."

The Committee on Fractures appointed by the American Surgical Association made a preliminary report at the last (1913) meeting of the association (*Trans. A. S. A.*, 1913).

This committee divided the profession as regards treatment of fractures into three classes and put its recommendations as answers to three interrogations, as follows:

"1st. What should be the routine method for the average general practitioner and those unskilled in surgery as a specialty?

"2nd. What should be the routine treatment for trained surgeons, surgeons with the usual facilities afforded by small or cottage hospitals?

"3rd. What should be the routine treatment for skilled surgical experts with adequate hospital facilities?"

For the first class, which includes all those not trained in surgery as a specialty, the Committee suggests the study and adoption of a routine method midway between that of immobilization on the one hand, and the mobilization of Lucas-Championniere, or the traction method of Bardenheuer, on the other. It is believed that either the method of the French surgeon mentioned or that of Bardenheuer, the German expert, probably will be found to require too much skill, experience and attention to be safe in the hands of those who only occasionally have need to treat the more troublesome fractures. For these general anesthesia should nearly always be employed for the diagnosis and reduction of the fracture, unless x-rays are used during the manipulations preceding the application of the fracture dressing. General anesthesia should always be used by such practitioners in the diagnosis and reduction of fractures involving joints. It alone will solve

many difficulties of diagnosis and often simplify the subsequent treatment of the injury.

If reliance is placed upon x-ray readings, the study of the skiagraphic plate must be under the direct supervision of a medical man accustomed to both clinical and radiographic examination of bone lesions. The radiographic reports of even expert radiographers alone are not always reliable guides to surgical practice. They must, as other pathological reports, be studied in association with expert surgical experience and clinical observation.

The maintenance of reduction of the fragments should be assured by position, traction, splints or other easily removable apparatus. Splints should be so arranged as to allow easy inspection of the condition of the fragments and soft parts, and to permit early passive and slight active movements. Molded splints of gauze and gypsum or other plastic materials fit and best fulfil the above requirements. The watchwords for this first class of practitioners are general anesthesia, plastic splints or traction, frictions and frequent inspection, early mobility, delay in weight-bearing.

What should be the routine for trained surgeons restricted by the moderate facilities of small or cottage hospitals?

Prolonged immobilization has probably been largely discarded already by most American surgeons, when they take personal care of the entire treatment of a fracture. This is especially true of patients in private practice. Mobilization, less than that advised by Lucas-Championniere, or traction apparatus, to a less extent than that used by Bardenheuer, varying with the locality of the injury, has been adopted by many and probably should be adopted by all such surgeons for the usual run of fractures. One or the other method will probably continue to be the routine at the hands of the class of surgeons mentioned in private practice and in small hospitals with moderate facilities.

This opinion suggests, it will be observed, that the operative treatment be restricted to especially rebellious fractures, known to be such or found to be such, after a very few days' study. This judgment is recorded because of the difficulty under such circumstances of insuring perfect asepsis and sufficient trained assistance.

The troublesome fractures that may with propriety be mentioned as probable candidates for operative treatment are:

Fractures of the surgical neck of the humerus, T-fractures at the lower end of the humerus, fractures of the upper third of the radius, fractures of the upper third of the radius with dislocation of the radial head, fracture of the radius and ulna in the

shafts, especially in adults, fractures of the upper third of the femur, supra-condylar fractures of the femur, fractures of the tibia and fibula near the ankle occasionally. In a general way it may be said that operative treatment suggests itself as the preferable method in any fracture which cannot properly be reduced or retained after reduction.

If operative treatment is the final resource metal plates under absolute asepsis should be used unless reduction alone, or suture, nails or screws are effective. When reduction of fragments is not easily gained or its maintenance is doubtful, plating will be usually found better than wiring. A few cases will not need direct fixation after the reduction has been accomplished through the incision. The operation should be immediate, that is, within a week or ten days after the receipt of injury. It is, in fact, better to operate within a few hours than to delay even a few days, unless shock or other contraindication requires delay. The method selected by the surgeon within the first week should, as a rule, be continued if the surgeon be familiar with both operative and non-operative procedures.

What should be the routine treatment for skilled surgical experts with adequate hospital facilities?

If prolonged immobilization has not been discarded, the surgeon can hardly be termed a skilled surgical expert in fracture treatment. He is behind the times in the surgery of fractures, though he be a recognized expert in abdominal, cerebral, thoracic, or pelvic surgery or other branches of the medical art. To a fracture specialist with the facilities, a sufficient number of trained assistants and the other essentials of a well-organized modern hospital, it makes little real difference in morbidity or mortality whether he select the non-operative or the operative plan. The latter, like all septic surgical procedures, requires more time, more care and more conscientious service at the beginning but makes the after days easier for the surgeon, less painful for the patient, and less troublesome for the nurses.

The time must soon come when metropolitan hospitals will not be considered satisfactorily organized unless fractures are assigned for treatment to specially equipped wards under the care of surgeons particularly interested in the pathology and treatment of these injuries. These surgeons may gain great advantage from the use of the fluoroscope while the adjustment of the fragments is in progress. Gunstock deformities of the elbow, forearms incapable of full pronation and supination, deformed wrists, valgus ankles, coxa vara, and shortened and crooked femurs all too frequently prove the need for increased surgical skill, perhaps

specialism, in the treatment of fractures of the tubular bones of the limbs.

It is probable, though not certain that consolidation of a fracture takes place a little more slowly after direct fixation of fragments than in a well-reduced fracture under non-operative treatment. The statement that the surgical expert will be able to conduct the patient in safety to the point of recovery with good result in most fractures by either the operative or non-operative route is true only provided he personally dominates the situation as to reduction, fixation and after-treatment and sets the time at which the patient shall be allowed to resume his original occupation. Such a surgeon, if of a mechanical turn of mind, will obtain good anatomical and good functional results in many fractures without blood-letting measures. In others he will not fail to recognize early the need for open reduction and direct fixation, nor will he fear sepsis, hemorrhage or shock. Similarly, he will seldom fail to recognize those cases, in which these risks of operation outweigh the benefits likely to be obtained through it. Then some of his patients will be treated by non-operative methods and may perhaps show poor anatomical restoration of the skeleton, as well as bad functional use of the injured limb. They will, however, live.

If, on the other hand, this expert have more liking for operative surgery and a mind less mechanical in its attitude toward fracture repair, he will apply operative procedures to a greater number of fractures than will his colleague above-mentioned. He will, however, equally recognize those cases, in which operative surgery of the blood-letting kind has no place."

2nd. *What method of treatment will give the patient the least suffering and discomfort after the reduction and fixation?*

With an experience of about 200 operated cases, I think I am fully justified in answering this categorically and say undoubtedly if thorough asepsis is obtained the operative method is followed by far less pain and discomfort than the non-operative.

3rd. *Which will be the method most likely to result in shortest disability of the patient, and give him afterwards the best functional result.*

My experience has been that the operative treatment is a little slower than the non-operative as regards the confinement of the patient. I think this is generally conceded by most operators.

As regards the best functional results in after-life, one cannot be so sure about this. Lane asserts that the final results are much better after the operative treatment. For Mr. Lane's cases I have no doubt this is true. I think it is not yet proved in

regard to the operative cases of all surgeons. This is a matter which must be carefully investigated and reported.

Some time ago a surgeon of a large industrial establishment told me that he had noticed that men who had been treated by the non-operative methods for fracture of the femur were never able to go back to their former laborious jobs. If this is true, it should have a very great influence in determining the operative treatment for fractures of the femur at least. While it has never been possible for me with the "floating" character of the patients whom I have treated to keep track of the majority of my cases of fractures, I have observed and known the final results of a sufficient number to be sure that many of my cases have been able to resume fully their former laborious occupations.

It seems to me at the present stage of our knowledge and experience, conservation in the treatment of fractures may best be obtained by following the suggestion so well expressed by Mr. Robert Jones of Liverpool, viz., "Before we reach to new things we must ask ourselves if we have done the best by the old; and it is only by being critics of our own work that we can discover each for himself which procedure will in his own hands give the best results."

METAL BONE PLATING A FACTOR IN NON-UNION. AUTOPLASTIC BONE GRAFTING TO EXCITE OSTEO- GENESIS IN NON-UNION OF FRACTURES.¹

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I have elsewhere² expressed the belief that metal bone plates and screws, applied to fractured bones, can, of themselves, be the cause of subsequent non-union. The two cases here recorded, which provide several other interesting deductions concerning fracture surgery, support that belief. Edward Martin³ states that "As a rule the presence of a plate in place of stimulating osteogenesis between the broken ends, retards it. This retardation is in some places [cases] so great as to entirely prevent union." John B. Roberts⁴ reports a case in which his "attention was called to the possibility of plating being a cause of delay in union"; and he quotes

other observers who believe that operative treatment, because of the manipulation of the tissues or otherwise, causes delay in union. Albee⁵, quoting Martin, accepts the belief that metal plates and screws may cause delayed and non-union, and advances it as one of the reasons for preferring his excellent bone-graft-inlay operation.

CASE I. F. A., a slender but healthy young nursemaid, falling down an elevator shaft in the summer of 1911, sustained a transverse fracture of the lower third of the left femur, 7 inches above



Fig. 1. Case I. Fracture of the lower third of the femur, after six months, (lateral view).

the line of the knee-joint, fracture of the left radius, fracture of the skull (?) and cerebral concussion. Perhaps because her serious condition after the injury prevented active treatment of the femur fracture, it healed with considerable angulation in the sagittal plane and with three inches shortening (figs. 1 and 2).

For the relief of this great shortening of her lower extremity, she was admitted to the surgical service of Mt. Sinai Hospital, about six months later (February, 1912). She was then in good general condition. The knee had a flexion range

¹ From the Surgical Service of Dr. Howard Lillenthal, Mount Sinai Hospital. The skiagraphs have been furnished by Dr. Jaches, radiographer to the hospital.

² Proceedings of the Surgical Section of the New York Academy of Medicine, January 3, 1913, *Medical Record*, June 14, 1913, p. 1160. See also Editorial in this issue.

³ Martin, Treatment of Ununited Fracture, *Surgery, Gynecology and Obstetrics*, September, 1912 (Vol. 15), p. 252.

⁴ Roberts, Operative Fixation as a Cause of Delay in Union of Fractures, *Annals of Surgery*, 1913, Vol. 57, p. 545.

⁵ Albee, *The Post-Graduate*, November, 1912.

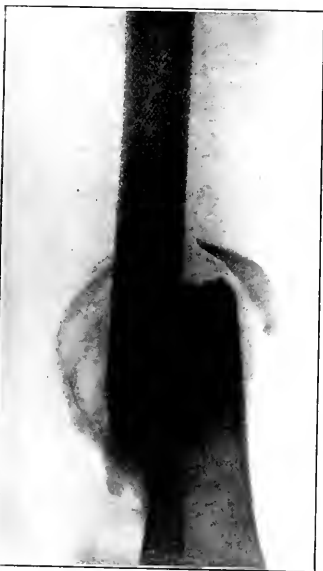


Fig. 2. Case I. The same as Fig. 1. Sagittal view.



Fig. 3. Case I. After Lane plating. Note the small fragment, which was left undisturbed at operation.



Fig. 4. Case I. Radiograph after brisement force of knee. Note avulsion of tibial tubercle and neighboring portion of bone. The bone graft is not seen in this picture (lateral view).

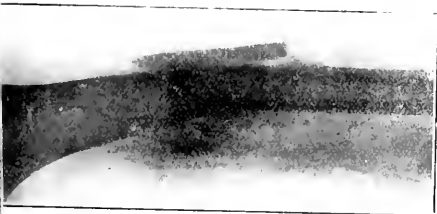


Fig. 5. Case I. A few weeks after the second operation, showing bone graft, and the callus following first operation that was disturbed. Note slight adduction of lower fragment.

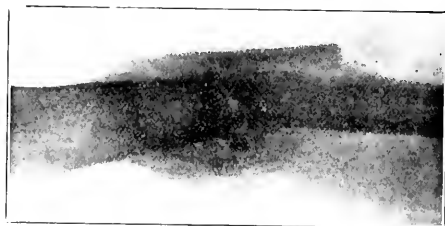


Fig. 7. Case I. Several weeks later. Note beginning fusion of the graft with the femur, and absence of rarefaction or absorption in the graft.



Fig. 6. Case I. A few weeks later.

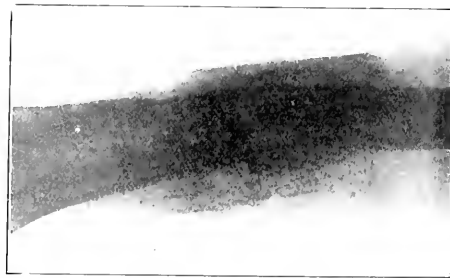


Fig. 8. Case I. Several months after second operation. Bone graft fairly fused to femur. No evidence of its rarefaction or absorption.

of about 45°. The lower third of the left thigh was the site of marked bony swelling and evident deformity of the shaft (as shown in the radiographs). There was, however, apparently solid union.

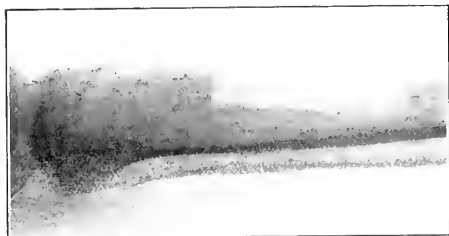


Fig. 9. Case I. The tibia a few weeks after removing the graft from it.

On February 29, 1913, I exposed the fracture by open operation. The fairly abundant callus



Fig. 10. Case II. Recent fracture of mid-shaft of femur, after attempted manual reduction, and immobilization.

about the shaft contained much cancellous bone, but it was not very solid and was easily lifted away, where necessary, with the chisel. There was little

callus over the ends of the fragments. A small bone fragment was found postero-internally, and this was not disturbed (fig. 3). Because of the much-shortened muscles, considerable effort, by leverage and traction, was required to bring the freshened bone ends into full alignment. This accomplished, a 3 $\frac{5}{8}$ " Lane plate was applied with four $\frac{3}{4}$ " screws (fig. 3). The muscles and periosteum were sewed over with chromicized catgut, and the skin wound closed. A long spica plaster-of-Paris cast was applied.

There was no undue reaction from the operation, and the soft parts healed *per primam*. After 6



Fig. 11. Case II. Six days after Lane plating. Note the excellent apposition and alignment.

weeks the patient was allowed to walk with crutches, in her cast.

On April 22nd, 7 $\frac{1}{2}$ weeks after the operation, I noticed slight forward bowing of the femur and slight mobility. The patient was put back to bed for several weeks and massage, which had been instituted in the sixth week, was continued. Then she was allowed to walk again, as before. But neither weight-bearing, recumbency nor massage favorably affected the now evident non-union.

On June 17th, about 15 weeks after the bone-plating, I again exposed the femur. The fragments were in good contact and alignment, the plate and

screws were in place and the latter had loosened but little in the bone. There was, however, very little new callus and none over the ends of the fragments.

I removed the plate and screws and laid over the same site, medullary aspect downward, an osteoperiosteal bone graft, $3\frac{1}{4}$ " long, $\frac{3}{8}$ " wide and $\frac{5}{16}$ " thick, chiselled from the tibia of the same extremity. This was applied merely as an excitant of osteogenesis, not as a splint. No gutter was made for it in the femur, the cortex of which was merely scraped to supply a fresh surface for bone adhe-

under narcosis. With audible snapping of the adhesions, the knee was very gently flexed 30° or less. The next day a small subcutaneous hemorrhage was noted about the tibial tuberosity, and a radiograph (fig. 4) showed that the brisement, gentle though it was, had torn loose a large segment of the tibial head.

To treat this the patient was again put to bed for four weeks, and no further effort was made to loosen the knee-joint.

During the two weeks in which the patient was walking about before she left the hospital, on



Fig. 12. Case II. Seven weeks after Lane plating. Deficiency at non-union.

sion. The fracture ends were not freshened, nor were the fragments otherwise manipulated. The bone graft was held in place merely by sewing over it the retracted periosteum and muscles. Plaster cast as before.

The cast was removed after six weeks, when there was solid union.

As a consequence of the prolonged immobilization (25 weeks in Mount Sinai Hospital, and several elsewhere after the original injury), the knee had become stiffened by fibrous ankylosis. To overcome this, on August 19th (9 weeks after the second operation) I performed brisement force



Fig. 13. Case II. Six weeks after removal of plate and application of bone graft. Lateral view, obscuring the graft. Note the fractures (marked by arrows) caused by brisement force.

October 1st, the mobility of the knee very rapidly improved, and within a few months thereafter it increased to 90°.

When I last saw the patient, several months ago, she had a very good range of knee motion, she walked well, the union of the femur and tibial fractures was solid, and there was no deformity. The shortening of the extremity is three-quarters of an inch or less.

To study the fate of the bone graft a series of radiographs (figs. 5, 6, 7, 8) was made at intervals of several weeks after its insertion.

The record of CASE II is in all respects the same as that of CASE I, except that it concerns a *recent* fracture, also transverse, of the middle of the shaft of the right femur in a robust muscular lad of 19 (fig. 10).

Immediately after his injury he was admitted, April 7th, 1912, to Mount Sinai Hospital. With no apparatus then at hand, repeated efforts at reduction by manual traction were made. These failing to overcome the overriding, which was $2\frac{1}{2}$ " under traction, on April 19th Dr. Lillenthal reduced the fracture by open operation, and attached a $3\frac{3}{8}$ " Lane plate with four screws. A long spica plaster cast was applied.

No undue reaction followed the operation; and the soft parts healed *per primam*. The excellence of the apposition and alignment is shown in fig. 11, a radiograph made 6 days after the operation. But neither the Lane plate nor the well-applied cast maintained that alignment. When the cast was removed, June 20th, seven weeks after the operation, there was evident forward bowing of the thigh and *non-union*; and a radiograph (fig. 12) showed decided forward angulation of the fragments and tearing away of the upper fragment from the plate.

On June 24th, I exposed the bone again. There was considerable recent callus about the fragments, except in the region of the plate which, with the two upper screws, had loosened from the proximal fragment, as pictured. I removed the plate, and found no evidence of beginning union within the line of fracture itself.

In spite of the decided angulation, the deformity was not very marked in this muscular thigh, and not sufficient to cause disability. I therefore decided not to disturb the callus or the bone itself by realigning the fragments. Leaving them undisturbed, I applied a tibial osteo-periosteal bone graft in exactly the same way as in Case I.

Six weeks later, August 6th, when the plaster cast was removed, there was *solid union*.

To overcome the fibrous ankylosis that had developed in the knee I performed a gentle brisement *forcé* on September 2d. A radiograph (fig. 13) taken a day or two later disclosed an infraction just above the femoral condyles and a tearing of the superior border of the patella. To treat this fresh lesion which, however, had given no symptoms, the patient was again put to bed for four weeks. When he left the hospital, after walking again for a few weeks, he had a rapidly increasing knee-junction. When I saw him last, about a year ago, his range of knee-motion was fairly complete; he walked well and although there was a noticeable, but not ugly, forward bowing of the thigh, there was only scant shortening of the extremity.

These two cases afford, I believe, the following deductions:

1. *A metal plate screwed to a fractured bone can, of itself, cause delayed union and non-union.* In seeking the cause of failure of union in these cases it must be remembered that: both were healthy subjects; in one the fracture was recent, in the other union had previously taken place; in both,

union was prompt after the plate was removed; in both, there was primary union of all the soft tissues; in neither, was any other cause for the non-union found at operation.

The evidence of two cases is not final, but it is fairly convincing, especially in connection with the similar experiences of other surgeons. For myself, I am sufficiently convinced of the correctness of this belief to advise against the use of a metal plate and (or) screws in any open operation in which simple reduction, or reduction and the application of an autoplasic, fresh bone splint-graft (cortical or intramedullary) will probably be sufficient.

2. *Neither a $3\frac{3}{8}$ " metal plate nor an additional well-applied plaster cast can be depended upon to maintain the alignment of a fractured femur shaft in a very muscular thigh.* It must be said that Lane is using much larger plates in these cases (the increased size also having objections, however), and avoids the plaster cast—which affords opportunity for passive and active muscle action and thus helps to maintain tissue activity.

3. Union might have taken place in both these cases after the mere removal of the offending foreign bodies. But I believe that it would have been slow, and that *the introduction of the simple bone graft actively stimulated the osteogenesis that had been inhibited in the fragments.*

4. A study of radiographs 5, 6, 7, 8, made at intervals over a period of about six months, shows *a gradual fusion of the bone graft with the femur, and affords no indication of rarefaction or absorption of the graft itself.* As far as this evidence goes, it supports the contention of MacEwen⁶ and contradicts that of Murphy⁷ and others.

5. After prolonged immobilization the bones (at the knee-joint, at any rate) are very brittle. *It is therefore unwise to perform brisement forcé for fibrous ankylosis, until the extremity has been in function again for some time—after which, it may not be necessary.*

30 WEST 92D STREET.

⁶ MacEwen, The Growth of Bone, James Macle hose & Sons, Glasgow, 1912.

⁷ J. B. Murphy, *Journal of the A. M. A.*, April 7, 1912, et seq.

In fractures of the anatomical neck of the humerus, examine carefully for injuries to the brachial plexus.

Fracture of the greater tuberosity of the humerus is one of the lesions that may be found in "stiff and painful shoulder." Radiographically it may have to be differentiated from calcareous deposit in the supraspinatus tendon, also a lesion frequently found in shoulder disability.

THE INLAY BONE GRAFT AS A TREATMENT OF UNUNITED FRACTURES. A REPORT OF FIFTEEN SUCCESSFUL CASES.

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This paper is supplemental to the following brief reports appearing in the *Journal of the American Medical Association*, August 3, 1912, page 353; *The Post-Graduate*, November, 1912, Vol. 27, No. 11; and Author's *Stereo-Clinic*, published by The Southworth Co., 1913; and is based upon the results of 15 cases of ununited fractures, and an experience gained from the application of the bone transplant to 205 additional cases of varying character.

I have often said that the Lane plate and other internal metal splints, when applied to ununited fractures of long standing, are a hindrance rather than an advantage in securing bony union. This view has been strengthened by the accumulation of experience.

The indications for treatment in fresh fractures and ununited fractures are entirely different although it is very evident from the discussion of these problems with various men and the large number of failures seen in our clinics, that many practitioners do not appreciate this difference.

In a large percentage of fresh fractures temporary fixation only is necessary to insure union, as the osteogenetic function of the fragments is active and in the presence of accurate apposition union occurs rapidly. The proper application of the Lane plate in suitable cases fulfils all requirements.

In ununited fractures the problem is quite different. We have here in the ends of the fragments a marked diminution or an entire cessation of osteogenetic activity. This cessation of activity is evidenced in the marked sclerosis or eburnation which is always found in ununited fractured ends, often extending back from the seat of fracture, from three-fourths to two inches.

The pathology of this condition of sclerosis is very similar to that found in non-ankylosing osteoarthritis where there is an over-deposit of calcium salts, and a consequent diminution and degeneration of bone-producing cells. The therapeutic requirements of these pseudoarthroses are fixation, and stimulation of osteogenesis on the part of the fragments, and an osteogenetic scaffold connecting the active bone in each fragment back of the eburnated areas.

The bone graft, when inlaid according to the herein described technique, is the only means of

fulfilling these requirements. Two, if not all, of these three essentials are necessary in order to secure union.

The Lane plate furnishes but one of these, viz., temporary fixation, but at the same time it causes absorption and disintegration of bone. The bone transplant not only produces fixation but also stimulates callus-formation and grows bone on its own part.

Abundant evidence has accumulated to prove that something more than fixation is necessary in these conditions. The most favorable cases for external fixation, such as fractures at the middle third of the tibia, with the fibula intact, have failed to unite in spite of months of effectual splinting and recumbency in bed. Operation showed no interposition of soft tissues and there was no evident reason for non-union.

Codivilla appreciated the above-mentioned thera-

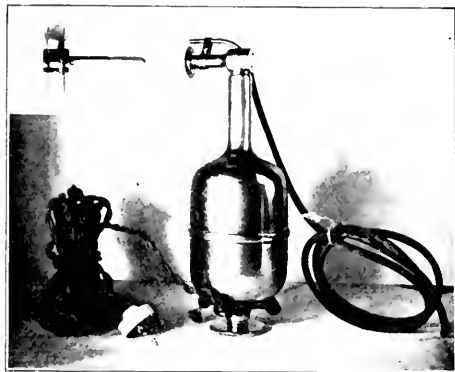


Fig. 1. The Author's modification of the Hartley-Kensley motor. The right angle arm for saw with gear for reducing speed of saw and the tube, on the left, for constant spray of saline solution on saw from an elevated donche bag are recent and important improvements. The above mentioned twin saw is shown in the left upper corner of the illustration, this can be easily and quickly adjusted into motor in place of single saw already there. For technique of its use see text.

peutic requirements and met them partially by spanning the fractured area with a very thin autogenous periosteal graft, which gave a fair percentage of good results. But it was not an ideal procedure in that it did not furnish efficient fixation, it did not stimulate osteogenesis between the end of the fragments, because it was entirely superficial, and it did not penetrate cortical bone structure. Being extraosseous it therefore furnished an imperfect graft environment.

Murphy has evolved a better method in his use of an intramedullary dowel, which furnishes more effectual fixation and, being entirely intracutaneous, favors stimulation of osteogenesis by better contact of graft to recipient fragments. It is, however,

difficult thus to get contact of graft to active bone beyond the sclerosed area, which is most important. It is also difficult of application in small bones, such as those of the forearm, where the medullary canals are small. As in the case of the intramedullary aluminum splint of Elsberg it is most difficult to secure the necessary lateral fixation in fragments of the ulna and radius, where these bones have been contracted together during long existing non-union.

An illustrative case that will be mentioned later was that of an ununited fracture at the middle of the radius of four years' duration. After four unsuccessful operations, including Lane plating, the radial fragment ends were found closely contracted to the side of the ulna. They were freed with

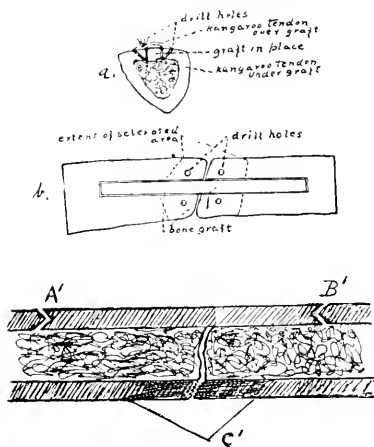


Fig. 2. Diagrams of graft in place in fracture of long bones. a. Is cross section of tibia with graft in place and held in place by kangaroo tendon sutures as described in above text. b. Is longitudinal surface view of graft in place showing location of drill holes for kangaroo sutures. c. Longitudinal sagittal section of bone graft in place. The diagram shows graft spanning the fracture area, also how the tongue and groove ends fit together. a, b. indicates graft. c. indicates fracture with sclerosed bone extending distally from joint of fracture.

difficulty and held in proper alignment by a long inlay bone graft. On account of the strong tendency of the angulation to relapse the necessary lateral fixation would have been impossible by any intramedullary splint. The problem was easily solved by the leverage action of a long inlay bone graft. It is always difficult to get a tight fit of the intramedullary splint into both fragments. In my experience with the Elsberg intramedullary splint, it was found after operation that in certain cases the splint worked out of one fragment into the other and thus failed to furnish the desired immobilization. This is not so likely to occur in the case of the Murphy intramedullary graft on account of the formation of expected early adhesions.

The technique applied in twelve of my cases, namely, fractures of the tibia, shaft of the femur, radius and humerus, was as follows:

The fractured area was exposed by a generous skin incision. When the fractured bone is superficial, as in the case of the tibia, the incision is made lateral to the intended site of the bone insert. The skin and subcutaneous tissues retracted, the bone ends are developed and freshened with chisel, motor burr or saw, and the sclerosed bone plug is removed from the medullary canal.

If there is overlapping of the fragments the amount of pull required to correct it varies with the degree of overriding at the site of fracture. In the case of a fractured femur in a muscular man, as



Fig. 3. Case 1. Showing conditions after Lane plating. Sagittal view.

much as a 150-pounds pull may be necessary to secure sufficient extension. In this instance, it is far better to set up and adjust a traction pulley apparatus with heavy weights. This provides a constant and uninterrupted pull. If the fragments still overlap and sufficient extension cannot be made to bring them together, it is necessary to trim off the fragments with motor burr, saw or chisel until good position can be secured. This will produce shortening, but it can not be avoided.

The fragments are now held in good alignment by an assistant. The periosteum is divided with a knife longitudinally over the bone to be removed in making the gutter for the bone insert. The periosteal flaps are turned back to either side exposing the bone.

Two parallel saw cuts, about $\frac{3}{4}$ of an inch apart, are made longitudinally of the fragment ends com-

pletely through the bone cortex to the marrow cavity with a motor twin circular saw (see fig. 1). The distance between the saw cuts is arranged by adjusting the distance between the twin saws. These cuts are made from $2\frac{1}{2}$ " to 3" into the end of each fragment from the line of fracture, while the fragments are held in good alignment. They should always extend far enough from the line of fracture to reach well into the non-sclerosed, active bone of either fragment. This distance is subject to considerable variation, depending upon the site of fracture and the amount of eburnation present. The distance the twin saws should be apart, i.e., the width of the gutter for the graft, should be from $1\frac{1}{16}$ " to $8\frac{1}{16}$ " according to the size of the bone. The revolving saws are kept constantly bathed in

greater the muscular contracture, the more securely is it held in place.

The exact length of the desired insert is obtained by measuring the gutter and transferring this measurement to the exposed antero-internal surface of the opposite tibia. A flexible probe is usually satisfactory for this purpose, a right-angled bend marking the exact measurement.

The wound and gutter are packed with hot saline compresses while the graft is being prepared. The patient remaining in the dorsal position, the graft-yielding tibia is exposed by an incision over its crest. The overlying structures are retracted, and the size and shape of the graft is outlined in the periosteum by means of the scalpel with the probe measure as a guide. With the twin saws adjusted



Fig. 4. Case I. After Lane plating. Lateral view.

saline solution by a spray connected with a sterile tube to a fountain syringe. This prevents the development of excessive heat from friction, which should be always avoided on account of its devitalizing effect upon peripheral bone cells.

After the twin saws have travelled the desired length to make the gutter for the graft, the bone fragments between the saw cuts are removed by severing the ends distal from the point of fracture with a narrow osteotome in such a manner as to effect a tongue-and-groove joint with the ends of the graft (see illustration). With motor-driven drill, holes are bored in the cortex on either side of the gutter slanting inward to the marrow cavity. These holes are placed near the line of fracture so as to fix the center of the insert. The ends of graft are secured in position by the above-mentioned tongue-and-groove joint, when feasible, or by additional sutures. This joint is very quickly shaped and the



Fig. 5. Case I. Showing bone graft in position and fragments aligned.

to the same distance apart as when forming the gutter, bone cuts are made to the marrow cavity along the antero-internal tibial aspect. With a narrow osteotome or small motor-driven saw or burr the graft is now dislodged and the ends grooved with the motor saw to fit the triangular tongue of the gutter ends.

A double strand of heavy kangaroo tendon is passed through the drill holes previously made. One strand in each fragment is now pulled up from the bottom of the gutter and the graft is placed under them. Traction is now exerted on limb and the graft is forced into position.

A good fit is assured because the same adjustment of twin saws is maintained both in forming the gutter and in removing the graft, and they must be of equal and uniform width throughout their whole extent. Traction is now removed and the

elasticity of the soft parts forces the tongue-and-grooved ends into tighter adjustment. The kangaroo fixing sutures are then drawn taught and tied over the graft.

It is readily seen that this not only affords most effectual fixation but also furnishes a most ideal environment for the bone graft. It brings each structural layer of the bone graft into close apposition with its corresponding layer in the recipient fragment, namely, periosteum to periosteum, cortical bone to cortical bone, endosteum to endosteum, and marrow substance to marrow substance. Periosteum, and when possible endosteum and marrow substance, are always included in the graft. We have proved by animal experimentation that this close contact of Haversian systems assures per-

osteal flaps which were reflected to expose the bone to be removed. This gives two layers of periosteum covering the transplanted fragment. The overlying tissues and skin are closed without drainage. The leg wound is closed in a similar way except that the adjacent muscles are drawn into the cavity from which the graft was taken. Splints are applied and not removed before five weeks.

ILLUSTRATIVE CASES.

CASE 1, M.S.—Female, 45 years old, always healthy. Four years previously she fell, fracturing the right radius at the junction of the middle and distal thirds, the ulna remaining intact. Fragments reduced under ether. No union occurring in eight weeks, fracture was cut down upon and muscle freed from the bone ends. Good apposition was



Fig. 6. Four months after operation. Ununited fracture of tibia and fibula of one and one-half years' duration. Middle aged woman of 250 pounds. Fracture of extreme lower end of tibia within $\frac{3}{4}$ inch from tip of internal malleolus with marked displacement backward of foot. A. indicates old point of fracture. Replacement difficult. An inlay graft about three inches long spanning the fracture was placed reaching to the tip of the internal malleolus and held in position. The mechanical action of the inlay graft placed into the inner aspect of the tibia held the reduced fragments perfectly, although there was a strong tendency to the recurrence of the old displacement. The fact of the loss of definite outline of the graft is due to the thorough fusing of it with the tibia.

manent viability at least of a large portion of the insert. The bone which has been removed from the ends of the graft in order to form the above-mentioned grooves and other normal bone fragments are finely chipped with a rongeur and pushed between and placed about the ends of the fragments at the line of fracture wherever possible. These act most effectively as supplementary foci of osteogenesis. MacEwen has well pointed out that the efficacy of a bone graft varies in inverse ratio to its volume. The smaller the graft the greater the relative osteogenesis.

The site of the fracture is covered with the peri-



Fig. 7. Comminuted fracture of lower end of femur. No union or callus formation after 69 days of fixation treatment in bed. Bone graft inserted, resulting in firm union in five weeks. There was loss of bone substance for about two inches and the graft was placed so as to span this distance, thus preserving nearly the full length of the leg. Upper arrow points to end of graft and to proliferating bone originating both from graft and the recipient fragment, on account of the necessity of the graft being so large in diameter it was not inlaid level with the periosteum.

secured but no union followed. A second open operation was performed and the fragments nailed together. Again no union resulted. At a third open operation the fragments were wired, but again no union followed. Two years after the fracture, at a fourth operation, Lane plates were applied, and this also was followed by non-union. Two years later, four years after the fracture, the patient in desperation consulted me to determine whether something further could not be done, for her arm was both painful and useless.

November 7, 1913, the fracture was cut down upon and the Lane plate was found loose in the peri-osseous tissues. The tips of the screws were found in large circular cavities in the bone from which they had loosened. There was a depression in the side of the fragment ends where the metal

plate had caused an absorption of bone. The radial fragments, as shown in figures 3 and 4, were much shortened from the previous operations and the metal contact, and badly angulated towards the ulna. Their ends were made fresh and with much difficulty their alignment was corrected. This caused the fragments to retract from each other about an inch. The periosteum on the outer side of each fragment was incised distally from the fracture for two and one-half inches and retracted, exposing the bone.

By means of the motor saw and osteotome a gutter was made in the fragments according to the above-described technique, about 3/16 of an inch wide, and three and one-half inches long.

With the motor saw a graft $3\frac{1}{2} \times 7/16 \times 3/16$ inches was removed from the anterior internal aspect of the tibia and trimmed with the saw so that it fitted tightly into the gutters in each fragment.

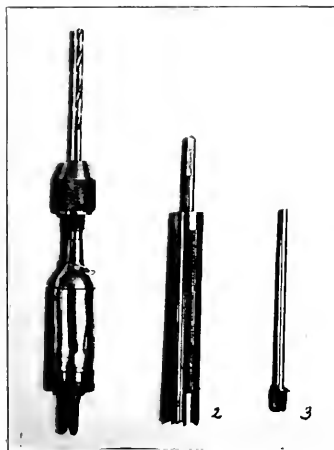


Fig. 8. 1. Is chuck holding small drill. 2. Is Author's dowelling instrument for turning out a perfectly round dowel for ununited fractures of the neck of the femur. This instrument is placed into the motor in place of the saw and while revolving very rapidly a graft (taken from the crest of the tibia by means of the motor saw) is pushed into it, thus being made perfectly round. The cutter at the lower end of the instrument can be changed for a smaller one for turning out pegs or nail grafts which are used in place of metal ones. 3. Is the Author's large motor burr drill for drilling the neck of the femur for the dowel graft. The dowel made by drilling instrument No. 2 fits tightly into the hole made by this drill.

The strong tendency of the angular deformity to relapse was prevented, and the fragments were held very securely by the heavy kangaroo bone suture previously described. A plaster of Paris cast was applied and upon its removal, five weeks later, firm union of the fragments had occurred in good position (see fig. 6).

CASE II, H. C.—Male, 28 years old, in an automobile accident in Scotland April 5, 1911, sustained a fracture at the middle-third of the right tibia and fibula. The fracture was reduced and placed in a plaster of Paris splint. Seven weeks later no union had occurred and Bier's hyperemia was applied for four months at a hospital in Scotland. No union resulted. One year after the fracture, with non-union, I cut down on the tibia and inlaid a graft

five inches long according to the above-described technique. It was not deemed necessary to disturb the fibula. In five weeks firm union had occurred. Excellent function existed twenty months after the operation.

In cases of non-union and certain fresh fractures of the vertebrae when displacement and cord pressure have not occurred, the bone graft as applied by me in Pott's disease is applicable for support and fixation (*Journal A. M. A.*, April 5, 1913; *New York Medical Journal*, March 9, 1912; *The Post-Graduate*, November, 1912.)

An illustrative case is that of a young woman referred by Dr. E. H. Johnson of Naugatuck, Conn. She sustained, in a railroad accident, a horizontal fracture through the middle of the body of the eleventh dorsal vertebra. Plaster of Paris jackets were worn continuously for one year, at the end of



Fig. 9. For further description of this case see text of the above mentioned ununited fracture of neck of femur in women 60. Arrow points to dowel graft from other tibia. (See fig.) Author's dowelling instrument. Firm union resulted. Lower arrow points to large amount of new bone proliferating from end of graft and extending into soft tissues.

which time support was so necessary that whenever the casts became soft the patient complained of pain and lack of support and asked for a fresh jacket. The tips of the 10th, 11th and 12th spinous processes were exposed through a circular incision to the right, turning up the flap of skin and subcutaneous tissues. These spinous processes were split *en masse* with the attached supra- and inter-spinous ligaments, with a scalpel, thin chisel and mallet. A graft of sufficient length was removed from the crest of the right tibia and inserted in the cleft. The split ligaments, with the imbedded fragments of the spinous processes, were drawn over it by means of interrupted sutures of medium sized kangaroo tendon. The patient was kept on a fracture bed for five weeks. The support from the graft thus imbedded gave immediate relief although no plaster of Paris jacket was applied. At this writing, one year later, there is no evidence of pain or lack of support.

In cases of ununited fracture of the neck of the femur the bone graft is even more necessary than in the shafts of long bones, for here the mechanics, blood supply, and osteogenic conditions are much more unfavorable to union.

This is exemplified by the case of a young woman who received a fracture of the neck of the femur and four months later non-union was evident. The pseudo-arthritis was cut down upon, the ends of the fragments were freshened and the fragments were held together by a long square tin-plated spike driven through the great trochanter and neck into the head. A long plaster of Paris spica was worn for ten weeks. Primary union of the soft tissues resulted. Much bone absorption about the spike occurred, and non-union resulted.

The above experience, among others, has induced me to evolve the following technique for the use of the bone graft in place of the metal spike:

Illustrative case. Female, 60 years old. Non-union of the neck of the femur of five months duration. The point of fracture was reached through an anterior incision from the anterior spine of the ilium downward for five inches. The ends of the fragments were freshened by chisel and sharp curette. A point just below the great trochanter was reached by a short lateral incision.

The proper location through the center of the neck and the direction of drill hole for the graft were determined by thrusting a small hand drill through the great trochanter obliquely upward through the center of the neck and into the center of the fractured end of the capital fragment, as felt or seen through the anterior incision. This may necessitate the withdrawal and reinsertion of the drill. When the proper location and direction for the drill hole was determined the large motor-driven drill was pushed inward along the direction previously determined, through the center of the neck and well into the head. This drill, made after my directions, produced a hole $\frac{6}{16}$ " in diameter. The drill was then disengaged from the motor and left in to hold the fragments in apposition while the bone graft was being removed from the crest of the opposite tibia.

This graft was removed by the motor saw and was about four inches long by $\frac{6}{16}$ to $\frac{7}{16}$ inches in cross-section. My dowelling instrument, which turns out a dowel of proper size to fit the drill hole, was then adjusted into the motor (see fig. 6).

While the motor was held by an assistant, I fed the graft slowly into the dowelling instrument. This was done with comparative speed and assured a perfect fit. This strong graft was driven into place by a metal mallet. The operative technique was precisely the same as when the metal spike is used. The skin was closed without drainage. In six weeks there was firm union. Six months after operation the patient walked about without pain and with perfect function.

SUMMARY.

The bone graft as applied in the fifteen cases of pseudo-arthritis herein mentioned, has given 100% of bony unions.

On account of the eburnation which always exists in the ends of fragments in cases of pseudo-arthritis, it is essential to use healthy bone from elsewhere in the body, as the tibia.

In cases of fresh fracture, however, the bone being normal, material can be taken from the fragments themselves and used to advantage. This is best done by making the saw cuts in one fragment just double the length of the other and transposing the two strips of bone removed.

This as well as other similar technique would be impossible without resorting to the motor saw. The proper use of the motor saw, by shortening the time of operation, lessening the traumatism, and affording a means for accurately shaping the bone grafts and their beds, has opened up a very wide field of application hitherto impossible of development. There are many technical difficulties in connection with bone work which could never be overcome except for the assistance of the motor saw and its various adjustable attachments.

In the repair of deformity and the result of traumatism of the skeleton the advantage of the use of its own material and of the avoidance of the former seemingly necessary foreign substances has been clearly demonstrated. Metal introduced into the tissues is in most respects the direct antithesis of the bone graft. It favors infection, absorption and disintegration of tissue.

The bone graft being living tissue has certain germ-resisting properties. It immediately becomes adherent and fixed to the contacting tissues. It not only stimulates the bone with which it is contacted to increased osteogenesis but it proliferates bone on its own initiative.

40 EAST 41ST STREET.

OPEN OPERATIONS IN FRACTURES.

Theoretically, open operations on fractures aseptically conducted should be of benefit in every way, first, by giving us a complete insight into the nature and extent of the injury; second, by enabling us to bring about more perfect adjustment; and third, by relieving much of the edema and blood stasis which is often so troublesome. Practically, we must bear in mind that infection does and will probably continue to occur in a certain, though perhaps small, percentage of cases, and where infection does occur, the last state of that man is apt to be worse than the first.—C. E. CALDWELL in *The Lancet-Clinic*.

In the aged, pain and disability in the arm after traumatism demand especial care in examination of the shoulder. Fracture of the head or greater tuberosity of the humerus is often overlooked.

ON THE DIAGNOSIS OF FRACTURE.

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It sounds like the rankest platitude to say that the physician should be able to recognize a fracture, and, having recognized it, should be able properly to treat it. And yet a large proportion—probably a majority—of suits for malpractice are based upon failure to recognize a fracture or upon its improper treatment; and a large portion of the cases of fracture brought to the consulting surgeon are those in which the injury was unrecognized at first or was improperly treated. And these failures, it must be remembered, are not merely failures to recognize details; they are failures to recognize the main injury.

It is worth our while, then, to inquire why these failures occur, why they are made by men who are careful and well-informed, and to learn if possible how to avoid them.

The difficulty seldom arises in fractures of the shaft of the long bones at a certain distance from the ends; and when it does so arise the probability of harm ensuing to the patient is slight, for there is little or no displacement of the fragments, and the pain or sense of powerlessness in the limb is usually sufficient to insure its adequate protection and withdrawal from use for a period sufficient for repair. Such a case might be, for example, a subperiosteal fracture of the clavicle in a child or a fracture of the tibia by a twist of the limb.

The forms of fracture in which the nature of the injury is most frequently overlooked are those in which the break involves the end of the bone or lies close to it.

The reasons of this failure to recognize are not far to seek. The commonest one, in my experience, arises through an unconscious or subconscious expansion of the rule given for the recognition of a fracture. That rule is that if abnormal mobility and crepitus can be detected a fracture is present. The examiner, seeking those signs and not finding them, is led to infer that their absence is proof of the non-existence of a fracture. This inference is so frequently made and is so frequently erroneous that I have sometimes been tempted to wish that these two signs of fracture might be banished from our text-books and our teaching. While I have applied this criticism to both signs, it is more specially applicable to crepitus. Almost always the physician

or the student in giving his reasons for thinking no fracture was present will say "I could not find crepitus." Much less often will he speak of abnormal mobility.

Crepitus is the click felt or heard when one fragment is moved upon another. If the fragments are not in contact or if they are not moved upon each other crepitus, of course, is not obtained. The conditions are frequent in which they are not in suitable contact or in which they cannot be moved by manipulation restricted within justifiable limits. Take, for example, a fracture of the neck of the femur, which is frequently and disastrously overlooked and in which, by the way, a vigorous search for crepitus may do irreparable harm. The small upper fragment is frequently so fixed to the lower one by impaction or interlocking or by untorn periosteum and other soft parts that movements communicated to the limb (the lower fragment) will far more easily find their center of motion in the joint than at the point of fracture. That is, the small upper fragment moves so easily upon the acetabulum that it accompanies the lower fragment in all communicated movements and no movement takes place between the two fragments, and consequently no crepitus is produced. It is not until the communicated movement has been pushed beyond the point at which the movement of the head within the joint is checked by normal anatomical, or perhaps abnormal, conditions that the manipulation forces the lower fragment to find a new center of motion at the point of fracture and thus produces crepitus. In pushing the exploration to this improper extent a favorable relation of the two fragments to each other may be changed for the worse or the periosteum of the neck, through which alone the vitality of the upper fragment can be conserved, may be further torn and repair be made impossible.

Fortunately there are other symptoms by which, without the aid of crepitus and abnormal mobility, the presence of a fracture may be recognized or its absence may be confidently assumed. Of these the principal one is pain, pain caused by certain manipulations of the surgeon or by the attempt of the patient to exercise the functions of the broken bone. The surgeon's manipulations are the making of pressure with the end of the finger over the site of the fracture, and the pressing of the fragments together, usually by pressure made in the long axis of the bone. In the first, the surgeon supports the limb broadly and firmly so as to avoid chance movements which might cause misleading pain,

and then with the tip of the finger or, when the bone is subcutaneous, with a smaller object such as the rubber on the end of a lead pencil, he makes pressure at various points over the bone. If a fracture is present such pressure along its line will cause pain strictly limited to the points pressed upon and their immediate neighborhood.

Thus, in a typical Colles fracture, pain will be found on the outer side and the outer portion of the dorsum of the radius; in a Pott's fracture, on the lower outer portion of the fibula, over the front of the lower tibio-fibular joint, and at the internal malleolus or just below it; and in a fracture of the external malleolus by inversion of the foot, at a point about three-fourths of an inch above its tip. In such cases abnormal mobility and crepitus are not needed for the diagnosis, and in most of them they cannot be obtained except by the use of undue force.

If a fracture runs across a bone, destroying its continuity, pressure of its two ends toward each other causes pain by pressing the broken surfaces together. Thus, in fracture of a metacarpal or metatarsal bone pressing the corresponding finger or toe upward causes pain at the point of fracture; in fracture of the surgical neck of the humerus pressure upward against the elbow causes pain near the shoulder; in Colles fracture pressure upward, or upward and a little outward, on the hand causes pain, and so, in like manner, does grasping an object firmly with the hand of the injured limb so as strongly to contract the flexors. In a Pott's fracture or a fracture of the external malleolus twisting the foot in the direction in which it was twisted to cause the fracture will be painful, and in a fracture of either condyle of the femur or of the external condyle of the humerus pressing the lower segment of the limb toward the injured side (and sometimes in the opposite direction) will cause pain. In all these manipulations it is essential that the effort be intelligently directed to effect the desired pressure and to avoid other stresses and pressures which might by chance act upon other injuries elsewhere and thus mislead.

In adults these measures are prompt, effectual, and safe. In children, especially the very young, they may be much hampered or defeated by the timidity of the patient.

The other method of causing diagnostic pain is to put the broken bone in normal physiological action as a lever to overcome some resistance. Thus, in fracture of the ulna an attempt to extend the elbow against resistance causes pain at the seat of fracture; coughing, as all know, causes

local pain when a rib is broken; biting, when the jaw is broken. All these tests are easily made when the patient is old enough and collected enough to make the required effort.

When one of these tests is affirmative, if it causes pain at the same spot each time, and if no other explanation of the pain can be given, it is almost invariably safe to make the diagnosis of fracture. But when the test is negative the inference that a fracture is absent must be drawn with some reserve. Some patients are exceptionally, remarkably, insensitive, and sometimes mechanical factors are present which prevent the contact or the movement of the fragment or the strain on the partly torn tissues which is needed to cause pain. And it especially needs to be noted that not infrequently in fracture of the neck of the femur firm pressure of the limb upward against the trunk does not cause pain. And we all know that such patients can sometimes walk; with some limping, it is true, but yet they can get about more or less well, sometimes for several days.

This fact, of course, is likely to mislead and is in itself largely responsible for some of the many failures to recognize a fracture at the hip. And these failures are so frequent that it may be well to point out in some detail the means by which the error can be avoided. In elderly persons the matter is simplified by the warning uttered a century ago, and often repeated, that in any case of obscure injury to an old man or woman which has caused even partial disability of the limb it should be treated as a fracture of the neck of the femur. We now know that these fractures are far more frequent in the young than was formerly supposed and that it is especially in the young that the ability to use the limb may be maintained. In such cases, in the absence of the x-rays, we must depend for the diagnosis upon pain and swelling. Shortening is absent, or if present and slight, cannot be depended upon because of the difficulty of exact measurement and the possible existence of a normal inequality. Independent mobility and crepitus do not exist. But there is pain on pressure behind the neck and sometimes on similar pressure in front or on pressure inward against the outer surface of the great trochanter. And, above all, there is fullness and resistance in front in the upper outer part of Scarpa's space, readily recognized on comparison with the opposite side. It is due in fracture at the base of the neck to the reaction in the overlying soft parts adjoining the seat of fracture, and in those of the narrow part of

the neck presumably to distension of the capsule. In the presence of these signs it is not only prudent but also, I think, a plain duty to make the diagnosis of fracture and rigorously to treat the case as such.

VICIOUS UNION, IN THE NEIGHBORHOOD OF JOINTS.

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It is a fact well known to orthopedic surgeons, that cases of vicious union in the neighborhood of joints form a conspicuous part of their labors in this special field of surgery. Unfortunately these cases are referred to us, not immediately or at an early stage, but more usually after a period of six weeks or more has elapsed after the union has occurred in a vicious position, often associated with deformity and a marked degree of shortening. The conditions found may be so divergent, that each case resolves itself into a special study. Indeed, so true is this statement, that the orthopedic surgeon needs to tax his resources in working out these problems before intertiring, as well as to use considerable ingenuity at the time of operation. The deformities often brought to the attention of the orthopedic surgeon, relating to vicious union include:

- 1.—Sprain-Fracture. (Rupture of the ligaments.)
- 2.—Separation of the epiphysis.
- 3.—Fracture in the vicinity of, or within the joint.
- 4.—Fracture complicated with dislocation.
- 5.—Vicious union in the vicinity of the joint.
- 6.—Ununited fracture in the vicinity of the joint.

1. *Sprain-Fracture.* This form of fracture, often seen about the articulation of the ankle or wrist, but which may occur at other joints, frequently occurs in football players and in victims of falls, as upon the ice, etc., in which there is an avulsion of a ligament from its bony insertion. Callender, who first observed it, described it as "a separation of a tendon from its point of insertion with detachment of a thin shell of bone."

2. *Separation of the Epiphysis.* This variety of fracture is found in those whose bodily growth is incomplete, the fracture occurring wholly or principally at the cartilaginous junction between the epiphysis and the shaft of the bone. In this frac-

ture the periosteum is usually stripped off for some distance from the shaft, remaining attached to the epiphysis. It is not infrequently found in the newborn due to traction upon the arm or in the axilla during delivery. Later in life, one of the forms of fracture of the humerus is separation of the epiphysis, the fragment usually comprising the entire epiphysis in several distinct and recognizable pieces.

3. *Fracture in the Vicinity of and Within the Joint.* These fractures are classified in regard to their topography to neighboring joints, thus, "intra-articular" indicates that the line of fracture extends into a joint, important because of the possible articular inflammation and of the possible change in the relations of the fragments, either of which may permanently restrict mobility in the joint. When extravasation reaches such an articular structure intra-articular effusion results as a result of irritation of the outer surface of the synovial capsule.

4. *Fracture Complicated With Dislocation.* In many instances of dislocation, because the associated structures are put on the stretch, the tearing of some ligaments, and the possible rupture of attached muscles, it is not infrequent to find fractures occurring as complications. Thus the shaft of the dislocated bone or of a parallel bone may be broken under such a force and strain. Fracture of the shaft or of the neck of the dislocated bone may prove a serious obstacle to reduction, because of lack of the leverage required for the surgeon in performing the necessary manipulations. As one of several illustrations, we may cite the fact that fracture is not an infrequent complication of dislocation of the shoulder. Such a fracture may involve the prominences of the humerus or scapula or the anatomical or surgical neck of the humerus. In anterior dislocation the upper part of the greater tuberosity is frequently broken off through traction of its attached muscles. The periosteal detachment may persist and the displacement be slight or, as in many reported cases, find lodgment in the glenoid fossa, thus offering a serious obstacle to reduction.

5. *Vicious Union in the Vicinity of a Joint.* This complication, also called deformed union, may result from imperfect reduction, from yielding of callus after removal of splints, or secondary displacement due to improper dressing and fixation apparatus allowing motion at the seat of the fracture. It may not, however, be due to any fault of the surgeon, as where great swelling precludes recognition of the displaced fragments, or where the bones are so crushed and comminuted that it is impossible to restore their shape.

6. *Ununited Fracture in the Vicinity of Joints.* Depending upon the period, when abnormal mobility has not ceased to exist, such a fracture is at first said to exist in a state of delayed union. Some weeks later the term pseudarthrosis, failure of union or ununited fracture, is applied. The causes may be *local*, as interposition of soft tissue, muscle, etc., between the fragments; *constitutional*, as in debilitating diseases, Bright's disease, syphilis, etc. The fragments of bone in ununited fracture, may not be held together by any material or the union may be ligamentous or merely fibrous. When the ends of the bones, approximate, move upon each other and are supported by a fibrous capsule, a false joint or pseudarthrosis is said to exist.

Before mention is made of any special operative methods, I would like to narrate of the many, two interesting cases, whose descriptions need no further comment.

Mrs. J. F., age 40, fell on the steps of a church and injured her elbow and could not raise the arm to the head. She was examined by physicians in her native town and seven months later was referred to a Philadelphia surgeon. Shortly after she was directed to me and offered the following symptoms, as taken from my case-book: Examination of right arm—Cannot raise the arm to the head, and there is an old thickening in the upper third of the right clavicle. There appears to be a displaced fragment in the inner condyle of the humerus (in the elbow joint). When the arm is extended it can be flexed only 30 degrees. There appears to be a forward dislocation of the humerus, as the triceps tendon is prominent. There has been, and still is pain over the ulnar nerve. When the arm is extended and hanging at the side the fingers are flexed. On the night of the accident, the woman's physicians set and dressed the affected part in a straight wooden splint and two weeks later, under ether, pulled and set at an angle, with a metal splint on the posterior surface. I saw that this was a fracture-dislocation of the elbow which was further corroborated by the x-rays. Accordingly, on February 10, 1912, just two weeks after she came to Philadelphia, I put her under ether and prepared for a partial excision of the lower end of the humerus. Under the anesthetic the arm could readily be flexed to 90 degrees with the ulna backward. I opened the joint to an extent of five inches by a posterior incision, freed the triceps tendon and lengthened it one inch, after which the joint appeared to be reduced. The ulnar nerve was exposed and was found larger and darker than normal. After the operation, the patient was enabled to flex the arm and put the hand to the mouth, and thenceforth steadily improved. She wore a brace for a time, and eventually completely recovered.

Another interesting case was that of a boy; L. B., age 12, sent from a neighboring Pennsylvania county, suffering from vicious union of the upper fifth

of the right femur, following a fracture. Examination showed the limb $2\frac{1}{2}$ inches shorter than the other with a thickened mass in the upper portion of Scarpa's triangle. The Roentgen ray examination showed an overlapping fragment, the fracture being just below the lesser trochanter. The operation was performed at the Philadelphia Polyclinic Hospital. I made an incision five inches long from the anterior superior spine of the ilium. The upper fragment was found drawn upward and inward through the action of the psoas muscle and firm union had occurred. This I separated with the chisel and freshened the ends of the bones. By using strong traction with the limb in the flexed position, the ends of the bones were brought in apposition. I had intended plating the ends of the bones, but I forsook the plan, as the patient was greatly shocked by the operation and manipulation. I then decided to close the wound and dress the limb on a double inclined plane, applying a weight of twenty pounds to the femur. As a result of this treatment shortening did not exceed $\frac{3}{4}$ of an inch and joint-motion is perfect.

TREATMENT.

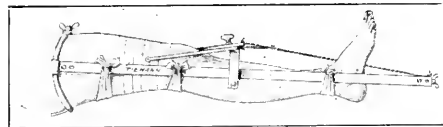
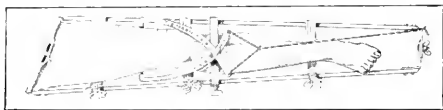
As has been previously stated, no set rules or positive directions can be arbitrarily set down in the treatment of the deformities incurred by vicious union in the vicinity of joints. Skill and ingenuity alone can successfully treat a class of cases, such as this, presenting varying and various types and degrees of deformity. I shall therefore content myself with the mention of a few salient points most relevant to the subject, remembering that this is no place to describe such measures as are ordinarily treated in the field of general surgery.

(a) *As to Separation of the Epiphysis.* Suspected fractures of this type should receive careful and prompt attention, as they are frequently overlooked—especially in the young. This is especially true in coxa vara traumatica (epiphyseal separation of the upper end of the femur), where often the absence of definite symptoms allows of the development of pronounced deformity. When the accident occurs during attempts to correct ankylosis, rachitic deformities, etc., the employment of a plaster cast in the best possible position in abduction is advised. (After Whitman's method.)

As to Complicated Fractures. So-called irreducible dislocations are often associated with fracture in their vicinity. In all such instances the previous history of the individual as regards injury should be considered, and a careful comparison of the injured part with its normal fellow should never be neglected. The reduction is frequently complicated by the associated fracture and displacement of the fragments of the joint, laceration of the soft parts and inflammatory deposits. An excessive amount of callus about the joint may complicate

hence any deviation of the limb as a whole from its correct position, either antero-posteriorly, laterally, or mesially, is bound to cause the corresponding displacement in the opposite direction at the point of fracture. The second defect is that no matter how carefully inserted, the nail almost never lies exactly at right angles to the long axis of the limb. There is no provision made for avoiding too much pressure on one end of the nail, and little or none on the other. Besides, such local mechanical adjustment could never be reliable, unless it were made exceedingly complicated. The third defect, as pointed out to me by Vernon the radiographer, is that the side bars being made of metal offer a serious obstacle in obtaining lateral exposures of the fracture.

With these objections in mind, I have devised a long hip splint (Figs. 2 and 3), reaching from the pelvis well beyond the heel. The upper padded ring is made in two halves which are hinged behind, while their free ends in front are locked with a thumb-



Figs. 2 and 3. Anterior and lateral views of transportation splint for nail extension cases.

screw. The lateral longitudinal bars are made of hard wood so as not to interfere with the x-rays; and the metal stirrup or cross-bar joining their lower extremities is composed of two overlapping slotted parts held together by a thumb-screw. The semi-circular support for the tongs is described below.

The splint is applied in the following manner: The thumb-screws at either end of the splint are loosened so that the oblique pelvic ring (heavily padded) is opened and its jointed halves are accurately fitted in place, the patient merely raising himself a little. As the ring is closed, the longitudinal bars and stirrup are adjusted. Slings of bandage material are passed behind the limb, at the middle of the thigh, the knee and the ankle. A metal arch with ends resting on the longitudinal bars, supports the Steinmann tongs and prevents them from impinging against the shin. Finally, the rope connecting the tongs and weights is firmly grasped and the weights are removed. Without lessening the traction, the

rope is fastened to the crossbar or stirrup. Once this is done, the entire limb may be moved by lifting the splint and this without causing pain or displacing the fragments.

The splint was used by me at the Knickerbocker Hospital last July (1913). At that time the side bars were of metal instead of hard wood.

ASTRAGALUS INJURIES.

FREDERIC J. COTTON, M.D.,
BOSTON.

For a bone of its size, carrying the entire body-weight, the astragalus has had too little attention paid to it.

Most men would have to think to locate it, and to think twice to describe its shape and functions.

The astragalus is a block-and-pulley bone,—all the tendons pass over it, most of them play in grooves on its surface.

Its function depends purely on its shape and its articulations. I have called it a "block," but it has a curious function, not to be classified in the terms of ordinary mechanics, for, owing to its peculiar form, and the strange obliquity of its lower joint-surfaces, it acts also as a transformer of the direction of motion—as a worm gear does in machinery. Through its presence between leg and ankle bones not only are the motions of flexion and extension carried out by the tendons that play over it as over a pulley, but a rotary motion is added, that of pro- and supination—a motion that occurs *only* in the joints between the astragalus and the other bones of the tarsus.

These movements, first accurately described, I think, in an article published in 1899*, are all important in the mechanism of foot movements.

The hinge motion between tibia and astragalus is simple; the rotary motion below the astragalus is very complex and not to be supplied by any mechanical substitute.

Hence the importance of astragalus injuries, and injuries of other bones articulating with the astragalus.*

Such injuries are not rare; they are confusing both from the variety of lesions possible and from the complexity of many of the individual lesions.

An excellent summary of the described lesions in this region may be obtained in the last (1912) edition of Stimson's *Fractures and Dislocations*.

For this paper, I have felt that a clearer perspec-

*R. W. Lovett and F. J. Cotton, *Trans. Am. Orthopedic Ass'n*, Vol. XI.

*For an account of the results of injuries of the os calcis involving the posterior joint between astragalus and calcis, see Cotton and Wilson; *Fractures of the Os Calcis*, *Boston Medical and Surgical Journal*, 1908.

just below the upper articular surface. Clinically, the ankle showed nothing beyond localized soreness. This man left the hospital early. Results not traced.

(3) *Apophysis lesions.*

The *apophysis* (os trigonum of the anatomist and embryologist) is a sort of spur extending outward behind from the astragalus (normally) of varying size. Often enough, after trauma, it is shown by the x-ray apparently separated or broken.

I am skeptical about these pictures. Certainly some of them, I think most of them, are cases of persistently separate ossification. I have seen two that I think were broken.* In both cases there were other lesions that complicated the picture. I believe the traumatic lesion to be rare and probably of little consequence, save as a diagnostic trap.



Fig. 3. Front view of the same case as Fig. 2, showing displacement of astragalus fragment laterally and the malleolar fracture.

(4) *Body fractures with luxation of fragments forward and back.*

This lesion has interested me particularly, partly because of the obscurity of the condition—the lack of recognition of what I believe to be a type; partly because the practical problem of repair presents real difficulties.

Three cases of this lesion have presented themselves to me within the past two years.

The first patient, a vigorous young man of 35, a Swiss civil engineer on detail expert work in this country, referred to me by Dr. John Whitehead, of Salisbury, North Carolina, had been riding in the Carolina woods when his horse bolted and eventually caromed against one of the trees that are lamentably frequent in these "pinney" woods.

Save that the foot was jammed between horse

and tree, there is no detailed information available as to the mechanism of the accident.

There were efforts at reduction. After two weeks I saw him. There were healed excoriations;



Fig. 4. Same case as Figs 2 and 3. April 8, 1913.

more important, there were areas of actual necrosis from trauma—sheer crushing of tissue.** (Note.) The conditions of bone damage are shown in Figs. 2 and 3.



Fig. 5. Sagittal view of the same case. April 8, 1913.

It was three weeks*** after the accident when I cut down on the joint on both inner and outer sides, and effected a reduction by direct leverage on the

*Note.—If one obtained sterilization and drying of tissue necrosed by traumatic pressure, it need not be a bar to open operation.

***The delay was partly due to time lost in the early attempts at reduction, and in travel, but in part also to the necessary preparation for operation. My routine is alcohol to dry, after opening blebs, then coconut-butter to soften; then the regular "two day prep." that I exact in all bone and joint work—scrub, soap poultice, alcohol and 2 per cent iodine.

fragments with traction on the foot and rotary manipulation.

This reduction went unexpectedly well, and the foot was held in plaster without trouble.



FIG. 4.—Ankle joint, showing fracture of the calcaneus. (L. A. W.)

Massage and manipulation were begun on the foot. The foot was held in plaster. Later passive motion was added.

In this case the patient was able to walk on the

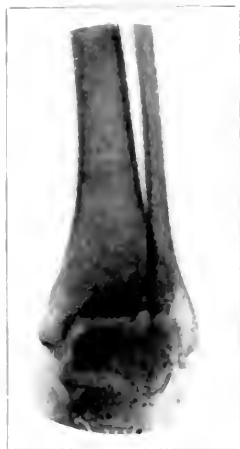


FIG. 5.—Ankle joint, showing fracture of the calcaneus. (L. A. W.)

tures and the patient was able to walk on the calcaneus matter.

The patient was discharged from the hospital in good health. The patient was discharged from the hospital in good health. The patient was discharged from the hospital in good health.

the ankle than I had hoped for, though the foot is a very serviceable one (Figs. 4 and 5).

A second case, very similar, occurred in a young woman who was mixed up with an automobile that "turned turtle."

Here, again, there was a complete rupture of the body of the astragalus with breaking of the fragments forward and backward from the tibia.

In this case, however, there was no lesion of the tibia or fibula (Fig. 6).

There was the usual trouble and delay before operation from crushed tissue and blood. Then, following with incision on both sides, by direct leverage, plaster, early active motion and use. In this case an early restoration of reasonably near normal function was obtained, but there was much swelling from damage to the trunk of the animal.



FIG. 6.—Ankle joint, showing fracture of the calcaneus.

The patient was discharged from the hospital in good health. The patient was discharged from the hospital in good health. The patient was discharged from the hospital in good health.

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tions, hard to describe, of which the following may serve as an illustration:

D. J., aged —, came to the Boston City Hospital September 26, 1913. His foot was grotesquely displaced outward, and the circulation much interfered with, the skin tensely and dangerously stretched. There was a tiny wound that rendered the fracture-luxation compound. He was promptly etherized, and the lesion cut down upon.

What we found was a rotary luxation of the body of the astragalus inward, rotated over ninety degrees. The body, broken loose at the neck, torn loose from all connections (apparently), lay turned out under the skin; the foot with the astragaloid head lay inward in extreme pronation. The vessels and nerves were displaced forward. (Fig. 10.)

Reduction proved impossible until the tendo Achillis was cut. Then rotation and reduction were accomplished. The cut tendo Achillis was sutured, and in the end the foot was put up in plaster, in good position.

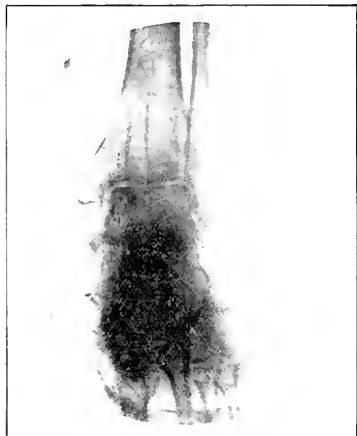


Fig. 9. Front view of the same case as Fig. 8. June 20, 1913.

This patient is now only convalescent. Evidently he is going to get a serviceable foot. Union is solid and bony. In this case the sloughing of bruised skin has brought about some delay but no joint infection or bone necrosis.

There are pure luxations of the astragalus as well as fracture cases. Commonest are luxations of the whole foot at the ankle with chipping off of one or another tibial joint-edge. Sometimes the luxation occurs without chipping (Fig. 11.).

(6) Here and there we find *forward luxation* with fracture of the front edge of the tibial joint surface; here, as a rule, the damage to the tibia is considerable.

(7) Much commoner is the *backward luxation* of astragalus and foot, associated not only with chipping away of the malleoli, but also with fracture and displacement of both malleoli. Such injuries

are rather common. Their importance rests largely on the loss of dorsal flexion due to the backward displacement of the astragalus and to the loss of any firm lateral support due to the slipping back of the astragalus out of the broken mortise which should hold it firm.

This lesion is treated in detail in a paper now un-



Fig. 10. Complete rotary luxation ("double rotary") of body of astragalus, compound. Photographs and sketch on the table before operation.

der construction; suffice it now to say that the important question is that of diagnosis; given a proper understanding of the condition, reduction is simple, and the results are no worse than those of the usual Pott's fracture.

The unrecognized, unreduced cases do extraordinarily badly.* The reduced cases recover extraordinarily well.

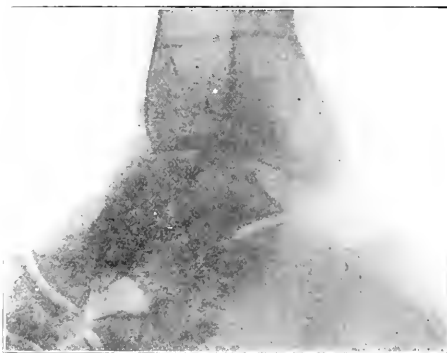


Fig. 11. Forward luxation of astragalus and foot at the ankle. No fracture save a minimal chipping of the internal malleolus.

(8) *Rotary luxations* of the astragalus without associated fracture seem to be a class established beyond cavil by the older literature.** I am a bit skeptical about the common occurrence of such displacements without fracture. I have not seen such cases, but I have had the chance to see two cases in which this lesion is recorded in long-ago records of the Boston City Hospital.

*Something, often much, can be done for these cases by late operation, but only upon the basis of a complete reconstruction of the ankle joint.

**This is the same lesion shown in Astley Cooper's plate long ago. A like case but with outward displacement—a case of Dr. Lathrop's is shown in Cotton: *Loc. cit.*, Figs. 1087-1088.

SOME IMMEDIATE AND REMOTE RESULTS OF FRACTURES OF THE SKULL AND OF THE SPINE.

CHARLES A. ELSBERG, M.D.,
NEW YORK.

[From the Second Surgical Service of the Mount Sinai Hospital (Dr. Howard Lilienthal), and the Surgical Department of the N. Y. Neurological Institute.]

The chief importance of a fracture of the skull arises from the injury caused to the brain and to the other cranial contents (nerves and bloodvessels). Hence, a consideration of some of the effects of fracture of the cranial bones has to deal mainly with the symptoms due to brain or nerve disturbance.

In many cases the cranial injury is of such severity that death is either immediate or occurs within a few hours. In not a few instances, however, the symptoms presented by an individual who has sustained an injury to the head are not definite, there is no evidence of a depression of any part of the cranial vault, no signs of fracture of the base (hemorrhage from the ears, subconjunctival ecchymoses, etc.). The patient may be fully conscious, he may be drowsy or in a stupor, there may be a weakness or a paralysis of one or more extremities, signs of irritation of sensori-motor tracts (twitchings or convulsions), exaggeration of normal and the presence of pathological reflexes. What physical signs are of importance? Should every patient with marked symptoms be subjected to operative interference?

Many surgeons incline to the view that all fractures of the skull should be operated upon; that an exploratory incision will do no harm; that a positive diagnosis can be made only by that means; that post-traumatic epilepsy is less frequent when fractured bone—even if there is no depression—be removed.

It has been my experience that the immediate and remote results of conservative treatment are very satisfactory, and I can see very little reason why a fracture of the skull without dislocation of the fragments and with few brain symptoms should be operated upon any more than a fracture anywhere else in the body.

Nor am I convinced of the correctness of the view often expressed, that epilepsy more often follows in those who have not been operated upon. It is mainly a question of correct diagnosis. If an individual is not operated upon who has depression of bone, a laceration of the dura and brain, or a large intradural clot, of course the statistics of the

frequency of epilepsy will be higher in the unoperated. In my experience, about one-third of all patients who have had a skull fracture develop, after one or many years, either Jacksonian or generalized epilepsy. In a very small number of these patients, operative interference will reveal a cystic collection of fluid, and with the evacuation of this fluid, the convulsions will cease. In a still smaller number of patients the attacks seem to be due to adhesions between the cortex and the membranes. In the majority of instances, very little is found at operation to explain the convulsive seizures, and, unfortunately, only a very few of the patients will be permanently relieved by the interference, no matter whether the surgeon divides adhesions or excises part of the cortex of the Rolandic area, and no matter whether the osteoplastic flap is replaced or whether a large bone defect be allowed to remain.

The indications for operative interference in fracture of the skull should be based upon the diagnosis of the condition present in the individual case, and upon the question whether there is a stationary or an advancing lesion. The fact that the patient is drowsy or in a stupor is not of itself an indication for operation, for an individual with so-called cerebral concussion without bony fracture or gross injury to the brain, may remain in a stuporous condition for many hours. It is a different matter if the stupor becomes deeper and if more and more evidence of increased intracranial pressure appears.

Congestion of the retinal veins and slight pinkish color of the discs occur with great frequency after simple fissured fractures of the skull, but if frequently-made ophthalmoscopic examinations reveal increasing changes in the fundi, we may be certain that the intracranial lesion is advancing.

That an individual has a weakness or paralysis of one or more limbs immediately after having sustained an injury to the head, does not mean that operation is indicated, for the operation will often fail to show a lesion that can be remedied by the surgeon. On the other hand, the progression of the symptoms—weakness increasing up to complete paralysis, twitchings increasing up to convulsions—is an evidence of an advancing process in the cranial cavity.

Nor is it necessary or advisable to operate upon every patient who presents symptoms of fracture of the base of the skull. If there are no evidences of greatly increased intracranial tension, operation can be safely delayed; if symptoms due to pressure from blood or from edema of the brain tissue appear, there is always time enough to perform a

deduced from the fact that the patient had been in the forms of a *fracture* of the skull and the fracture lines will be found to be clearly visible.

I have been able to find only one case with fractures of the skull and a fracture of the spine.

1. *Fracture of the skull and fracture of the spine*—The patient with a fracture of the skull and a fracture of the spine, who has been found to have a fracture of the skull and a fracture of the spine, but they are not the same fracture.

The pulse and respiration are normal, but the course of the fracture is not normal. The fracture may develop into a fracture of the spine, but it is too slow, and is not a fracture of the spine.

The pulse and respiration are normal, but the intervals and the fracture are generally examined every few minutes. The fracture is a fracture of the spine, and the fracture is a fracture of the spine.

An exploratory puncture of the skull may not have to be done and it can often be accomplished under local anesthesia. A small drill hole is made through the soft tissues of the scalp and the bone, and a blunt pointed aspirating needle is passed through the drill hole until the dura is reached. If aspiration fails to reveal blood, the needle is pushed through the dura and aspiration is again done. If this means we are able to determine with certainty whether there is any considerable collection of blood inside or outside of the dura. If the patient becomes more markedly ill, a subdural or dural depression may be indicated.

2. *Patients with a fracture of the skull and a fracture of the spine*—The patient with a fracture of the skull and a fracture of the spine, who has been found to have a fracture of the skull and a fracture of the spine, but they are not the same fracture. The patient with a fracture of the skull and a fracture of the spine, who has been found to have a fracture of the skull and a fracture of the spine, but they are not the same fracture. The operation should be done with the patient in a prone position, and the fracture of the spine should be done with the patient in a prone position. The operation should be done with the patient in a prone position, and the fracture of the spine should be done with the patient in a prone position.

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Referred to the patient, who has been found to have a fracture of the skull and a fracture of the spine, who has been found to have a fracture of the skull and a fracture of the spine, but they are not the same fracture. The operation should be done with the patient in a prone position, and the fracture of the spine should be done with the patient in a prone position.

DISCUSSION

There is a considerable number of cases of fracture of the skull and a fracture of the spine, who has been found to have a fracture of the skull and a fracture of the spine, but they are not the same fracture. The operation should be done with the patient in a prone position, and the fracture of the spine should be done with the patient in a prone position.

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cord. Such a course is rare, however, and the symptoms of a complete transverse lesion of the cord will generally persist to the end uninfluenced by operative treatment. Therefore it is useless to subject these patients to operation, and the surgeon must not be misled by the return of some of the tendon reflexes. I have, in several instances, observed a very slight knee-jerk return for a few days, many weeks after a complete transverse crush of the cervical cord. One of the reasons why laminectomy for fracture of the spine has fallen into considerable disrepute is that so many patients with a hopeless lesion have been operated upon.

It is quite a different matter with those patients in whom the paralysis is not complete, in whom there is not a complete loss of all sensation up to the level of the injury, in whom some of the reflexes persist and are perhaps exaggerated. The majority of these should be operated upon as soon as possible after the injury, especially if x-ray pictures show marked distortion of the spinal canal by fractured bone or dislocated bodies of the vertebrae. It has been my experience that those patients who have marked root pains are very favorable cases for operative interference, while in those who are free from pain, the outlook for great improvement after the operation is not so good.

Some patients have few symptoms from a spinal fracture because there is little or no dislocation of the fragments, but many months or years later, they begin to show symptoms of interference with the functions of the spinal cord. The symptoms are often due to narrowing of the spinal canal by a new growth of bone, or callus has caused a more or less marked angulation of the cord with pressure upon nerve roots. These patients can be entirely relieved of their symptoms by a wide laminectomy, which relieves pressure upon the cord and nerve roots and straightens out the angulation by allowing the dural sac to bulge backwards.

It is a well known fact that slight trauma of the spine may be the starting point of a hematomyelia, and it is very possible if not probable that injuries of a mild character may be an important etiological factor in many cases of spinal disease. If one carefully inquires into the history of many patients with spinal diseases, it is quite remarkable that one will very often learn of an injury to the back which preceded the spinal affection by many years.

Severe localized pain after traumatism, especially in children, may be due to subperiosteal fracture. Extreme localized tenderness is the chief sign; abnormal mobility and deformity are absent, and crepitus may not be elicited.

FRACTURE OF THE SKULL: THE ROENTGEN RAY AS AN AID IN ITS DIAGNOSIS.

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AND W. H. STEWART, M.D.,
NEW YORK CITY.

The skull is described as "A superior expansion of the vertebral column as if composed of four vertebrae, the elementary parts of which are specially modified in form and size and almost immovably connected, for the reception of the brain and special organs of senses."

The structure and dome shape of the skull with its double deck of compact substance and intervening cancellated material, its ribs and bridging and tressling, its thickened protuberances at prominent and susceptible points, the peculiar dovetailing of the sutures, its shape and moveability, the elasticity of the outer table, the overlapping of some bones, the density and mobility of the scalp (and in youth the number of bones having a tendency to break up the force of a blow) all combine to make this casing for the vital structures resilient to external violence. It has, however, due to lack of uniformity of thickness, weak points which are particularly susceptible to injury. One has only to hold the base of a skull to a light and view from the inside to note these weak points. They are the centers of the orbital plates of the frontal bones, the middle cerebral fossa, the center of the squamous portion of the temporal bone and the center of the inferior occipital fossae. These thin points seem to have a direct bearing upon the location of fractures, particularly of the bursting linear fractures extending into or originating in the base from blows on the thicker expanse of bone forming the vault or blows on the point of the jaw or from violence transmitted upwards from the spine, as falls on the buttocks.

Because of the shape of the skull, its elasticity, its closely fitting covering of skin, muscle and fascia and periosteum on the outside, and the pressure of the intracranial contents and presence of a second periosteum, the dura mater, on the inside, fractures of the skull have a strong tendency to immediately replace and maintain themselves in position. For this reason a fracture of the skull itself subsides into secondary importance. The vital considerations are the amount of injury to the blood-vessels, intracranial nerves, dura and brain substance, and the opening up of possible avenues of infection, meningitis, cerebritis, encephalitis, abscess, epilepsy, insanity, softening, secondary traumatic insanity, post-traumatic psychoses and post-

traumatic neuroses. But as a clue to the location of the serious lesion the fracture is of utmost importance.

It is a noteworthy fact that each succeeding collection of statistics of the relative frequency of fractures give fractures of the skull an increasing percentage. Thus:—Gurlt gave 1.45%; Von Bruns gave 3.4%; Chudovsky gave 3.8%. These figures we believe, in view of more accurate diagnosis with the x-ray, altogether too low. If a systematic x-ray

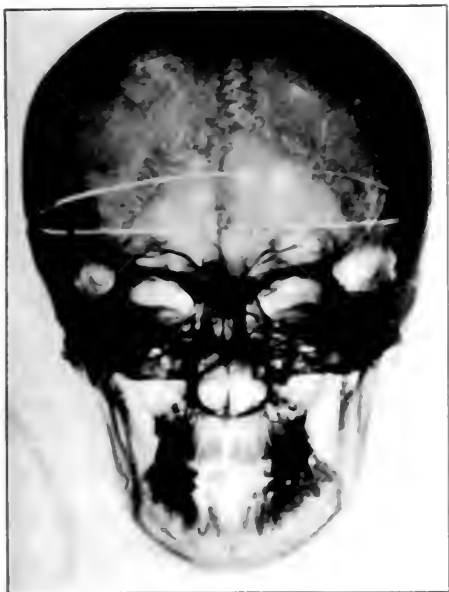


Fig. 1—Showing fracture.

examination were made of all injuries of the head, direct or indirect, we are sure it would be demonstrated that the relative frequency of fractures of the skull would show a much larger percentage.

Every skull receiving violence imparted either directly or indirectly with or without symptoms of intracranial injury should be considered possibly fractured until proven otherwise. A fracture of the skull can result from apparently trivial cause without any external manifestation of an injury and without any symptoms of intracranial injury. The x-ray frequently demonstrates a fracture of the skull where there were no symptoms, nevertheless it is very important to diagnose a fracture for the possible occurrence of remote sequelae, etc. From our experience we have no hesitation in stating that the majority of fractures of the skull are not diagnosed as such and remain undiagnosed.

For the reasons we venture to emphasize the and that can be rendered in discovering and locating these fractures by means of the Roentgen ray. In a hurried review of the English literature on the subject we failed to find one instance where the x-ray was used as an aid in the diagnosis of fractures of the skull. Most of the text-books urging the necessity of positive diagnosis in fracture of the skull, yet fail to mention the x-ray.

The following statements, by recent writers illustrate the necessity of making a correct diagnosis of fracture of the skull, yet fail to mention the advantageous use of the x-ray.

Seudder says, "It is not an uncommon experience for the surgeon to be called to an individual who is unconscious following a blow on the head. A



Fig. 2—Illustrating position to obtain photograph shown in Fig. 1.

swelling is evident on the top or side; palpation reveals a hemisoma. It is sometimes impossible to distinguish between a hemisoma and fracture of the skull." Agnew says, "A knowledge of the nature of the fracture will help in determining the nature of the brain and a linear fracture of the skull with rupture of the middle meningeal artery."

William Gordon Huggins says in his Clinical Treatise on Fractures, "A mere fissure in the vault of the cranium accompanied by moderate and temporary compression of the brain will diminish or abolish the perception of no sign indicative of its existence can be felt through the scalp." Agnew says, "If there is a wound leading to the seat of the fracture, the existence of the latter being immediately revealed, its proper management may be at once determined upon without recourse to the presence or absence of

cerebral symptoms." "It must be mentioned, however, in qualification of this statement, that there is a certain number of fractures of skulls, especially of limited areas in which localization is of inestimable value in indicating with extraordinary precision the site of the lesion, while as already stated,

Thus is advised compounding a simple fracture in order to make a diagnosis when the x-ray will very much more easily aid one.

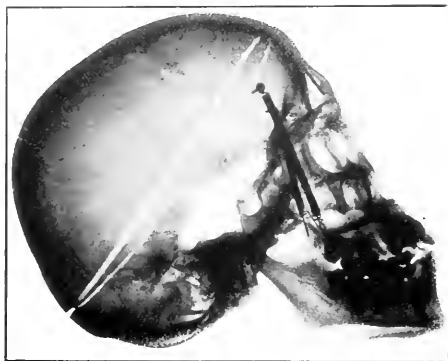


Fig. 3.—The lateral view, temporo-parietal region.

an intracranial lesion at any point may produce general symptoms identical in all respects with those due to fracture, when such symptoms are present, fracture being the removable cause, *it becomes a matter of first importance to prove or eliminate its presence.*"

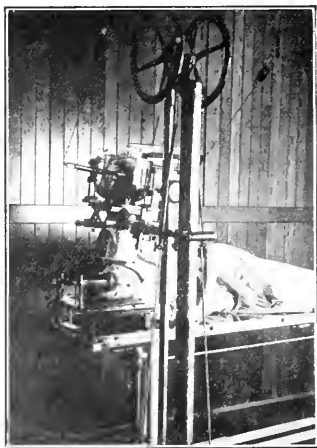


Fig. 4.—Illustrating position to obtain photograph shown in Fig. 3.

E. A. Babler says that, "Every hematoma of the scalp should be exposed, thus the diagnosis must be made by exploration of the hematoma or laceration or by palpation."



Fig. 5.—Illustrating position to obtain photograph of occipital region shown in Fig. 6.

John B. Murphy in "Practical Medicine Series for 1912" says, "personally the author has been impressed with the frequency with which a patient with an apparently insignificant hematoma or laceration was admitted with a normal temperature and mentality, and yet careful examination would



Fig. 6.—Showing occipital region.

show a depressed fracture of the vault with more or less injury to the brain."

It is interesting to note that Cushing does not

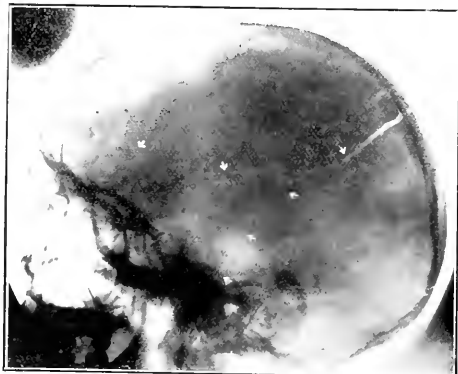
liar anomalies that creep into the routine work of medical practice.

Patients are often in a comatose or irritable con-

paralysis are present, they are a clue to the possible site of the fracture and attention is naturally directed toward that region; this must not mislead



Case 4. Age 17 years. Patient fell three stories striking on his head on a stone pavement. The radiograph reveals a linear fracture of the right parietal bone low down, extending downward into the squamous portion of the temporal bone to the region of the external auditory canal.



Case 6. Age 16 years. Patient was hit upon the head while watching several boys playing dice. X-ray finding: "A long forked linear fracture extending from the upper portion of the occipital and horizontally across the left parietal and temporal into the frontal bone; the lower fork extending downward and terminating in the petrous portion of the temporal bone."

dition when referred to the Roentgenologist, and a great deal of patience and perseverance is required. It must be constantly borne in mind that the minimum amount of disturbance and movement is the

one, however, for every case should have the frontal, parieto-temporal and occipital regions radiographed.

In the examination of the frontal region we



Case 5. Age 5 years. Patient said to have fallen off a fence to the stone court below, striking on his head. X-ray findings revealed a vertical fracture of the right parietal bone extending downwards into the petrous portion of temporal bone.



Case 7. Age 12 years. Boy fell from the first story fire escape to pavement below, striking on his head. Radiographic examination reveals a long linear forked fracture of the right parietal extending horizontally and downward into the greater wing of the sphenoid bone.

rule. The head must be absolutely fixed and all respiratory movement overcome.

If the objective symptoms, such as bleeding from the ear, laceration of the scalp, hematoma or

should endeavor to show on our radiographs as much of the vertical plate of the frontal bone as possible, as is shown in Fig. 1, taken from the dried specimen. This is best obtained by placing

the patient flat on the abdomen, with the head tilted down, resting on an inclined plate at an angle of 25 degrees. A small one-half inch diameter plate, about five inches in length, is used. The vertical line in Fig. 2 represents the central ray and should be directed on the glabella and directed straight down (Fig. 2). A tube is used if rather light exposure will take about 45 to 50 milliamperes and an exposure of about 5 seconds is given. The procedure, in the majority of cases, will give satisfactory radiographs of this region. It is frequently the case that our patient's condition will



FIG. 3. Case No. 1. Age 10 years. Skull x-ray. The posterior region of the posterior skull. The occipital bone and the base of the skull are visible.



FIG. 4. Case No. 1. Age 10 years. Skull x-ray. The posterior region of the posterior skull. The occipital bone and the base of the skull are visible.

not allow the manipulation necessary to place the plate in the above position. The procedure must then be reversed, the tube being put off beneath and the plate above.

In radiographing the posterior part of the region, should show that posterior part of the skull, including the sagittal suture above the occipital suture, anteriorly, the lambdoidal suture posteriorly and including the entire temporal bone. Both sides of the head must be examined (Fig. 3). The patient is in a direct lateral view. The patient is positioned with the head resting easily on a support, which has a special adjustable support for the head (see Fig. 4). A one-half inch diameter plate, 7 inches in length is used. The central ray is directed at about the midtemporal region, along an imaginary line extending from the ear and perpendicular to the center of the head. The exposure is made to the lower edge of the plate. The exposure is any condition of the head from the posterior side of



FIG. 5. Case No. 1. Age 10 years. Skull x-ray. The posterior region of the posterior skull. The occipital bone and the base of the skull are visible.

put flat down on the plate (see Fig. 5). Fixation having been made, a cone with an outlet of four inches is used, the vertical axis being centered on the foramen magnum; the tube is placed at an angle of 15 degrees back of the vertical axis and directed towards the foramen magnum, the upper edge of the cone being just above the supraorbital ridges. The high vacuum tube is again used and an exposure of five seconds is made. (A radiograph such as shown in Fig. 6 should be obtained—this is from a dried specimen).

A hypodermic injection of morphine, where much irritability is present, will aid in obtaining satisfactory radiographs.

INTERPRETATION.

The normal radiating lines of the grooves in the inner table of the skull, accommodating the meningeal blood vessels, cast shadows which may be mistaken for fractures of the skull. To one, however, who is familiar with the course of these vessels it is not difficult to differentiate. Fractures usually show in the radiographs as light, sharply cut lines of varying width, depending on the amount of separation. These fracture lines are usually at direct variance with the shadow lines of the meningeal grooves.

The radiographs here reproduced illustrate fractures in the frontal, temporo-parietal and occipital regions. Arrow heads outline the fractures.

In very many cases it is not necessary to the diagnosis of fracture to elicit crepitus and abnormal mobility—often painful manipulations. In several forms of fracture there are other positive diagnostic evidences. Thus, with Colles' fracture the level of the styloid of the radius will almost always be found to have receded from beyond that of the styloid of the ulna. Moreover, x-ray examinations save much painful manipulation.

The radiograph of the elbow of a child shows shadows of numerous epiphyses. One inexperienced with x-ray plates is very apt to mistake one or more of these for fractures. When examining the skiagraph of a child's elbow suspected of fracture or dislocation, it is, therefore, important to have the normal picture in mind, or better yet in hand, for comparison.

Fractures of the head of the radius are probably more common than generally supposed, being overlooked frequently because of the absence of the ordinary signs of fracture.

THE OPERATIVE TREATMENT OF FRACTURE OF THE OLECRANON.*

A. W. SHEA, M.D.,

NASHUA, N. H.

Fracture of the olecranon, while comparatively infrequent, demands as much care and judgment in its treatment as do other similar lesions about the elbow joint.

As an extension of the ulna, the olecranon completes the lever of the forearm, the fulcrum being at its narrowest and weakest point, opposite the convex articular surface of the humerus. Here the injury usually takes place. The bone is, however, strong and tough, and is further reinforced by an expansion of the aponeurosis of the triceps which extends downward for some distance beyond its insertion.

Whether the fracture is caused by direct or by indirect violence, the degree of separation of the fragments determines the conditions found, which are loss of extension, tearing of the periosteum and fibrous tissue, swelling and effusion into and about the joint, which is almost always involved.

As in other fractures, bony union is the only perfect union, and while many cases with ligamentous connection give good and useful joints if the fragments are not too far separated, yet it is obvious that with one arm of the lever shortened the power of the triceps can never be as great as if the entire bone were intact.

Subperiosteal fractures and those of greater degree where the fragments can be brought into direct apposition are no doubt best treated conservatively by proper splint and fixation.

Where the separation is a half inch or more, a good, strong joint cannot be expected unless some more radical plan of treatment is followed. I have recently had an opportunity to care for three such cases, and in each, contrary to the usual statement, there was a large fringe of fibrous tissue over the ends of the broken bone, similar to that seen in fracture of the patella. The wider the separation, with consequent laceration of the soft tissues, the greater is this liability. This condition of itself would prevent bony union, even were it possible to bring the parts together without operation.

The usual method followed in operative cases is to drill the bony fragments and to hold them together with some form of suture, either wire, kangaroo tendon, or chromic gut. This is done either by an open incision or subcutaneously. Many cases do not result in bony union.

* Read at the 22d Annual Meeting of the New York and New England Association of Railway Surgeons.

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WALTER M. BRICKNER, M.D., Editor

NEW YORK, JANUARY, 1914.

FRACTURES.

So much attention is being devoted to improving our methods of reducing fractures, so many mechanical devices are being proposed, and so much discussion is taking place concerning the relative advantages of these devices and the indications for radical procedures, that special interest will, we are sure, attach to this issue of the JOURNAL, containing, as it does, so many excellent articles, written by competent and experienced observers, and dealing with various phases of the operative and non-operative treatment of fractures, in general, and certain fractures, in particular. A review and bibliography of recent fracture literature will also be found on page 52.

The treatment of fractures is probably as old as man himself, and for at least as long a time as we have satisfactory records it has not varied in the principles involved: 1st, reduction of the fragments; 2d, immobilization (retention of the reduction) for a greater or less period, and 3d, the prevention of disability. Attention to the third principle has considerably altered the practice of the second; and efforts more thoroughly to apply the first have introduced new methods of traction, and the exposure of the fragments to vision and direct manipulation.

But whatever the mode by which these principles are applied the union of the bone, like the healing of other tissues, must be left to Nature. Artificial means may encourage or stimulate that healing; but also they may retard it. And this, in our opinion, is one of the ob-

jections to certain types of open operation, as pointed out by Magruder and by us elsewhere in this issue.

The greatest of all the contributions to the management of fractures is, of course, the x-ray; and it would be platitudinous to repeat here the various reasons why radiography should be invoked as a routine in the treatment of fractures and in the diagnosis of all those conditions in which, by reason of direct or indirect violence, a fracture may be present.

Curiously enough, in spite of all we have learned from the innumerable radiographs that have been made in nearly two decades, they have discovered, as far as we can now recall, no hitherto unknown variety of fracture—except that of the base of the fifth metatarsal from indirect violence, described some few years ago by Robert Jones.

Radiography has emphasized what, to be sure, was known before, viz., that perfect reduction is not essential to good function. Equally important is its teaching that perfect reduction is rarely accomplished even by open treatment. Nevertheless, not a few surgeons, perhaps in an effort to approach perfection, have advised the more or less routine operative management of a wide variety of fractures. Most surgeons, however, have more wisely recognized as the legitimate field for radical measures those cases only in which, without them, function is, or threatens to be, impaired. This attitude is gaining in acceptance, as the reports of the British and American Fracture Commissions indicate, and the articles in this issue of the JOURNAL demonstrate.

The operative treatment of fractures is not new; it has been a familiar practice on the patella, the olecranon and at other sites. It has grown, however, with improvements in technic, the invention of bone levering and holding instruments, and the addition to suturing, wiring and nailing of other, more rigid fixation devices.

It is in fracture of the adult femur shaft that radical treatment has its least-disputed claims to superiority. Here the contraction of large muscle masses usually produces an amount of overriding, and corresponding shortening of the extremity, that manual traction, however vigorous, will not overcome. The adhesive-plaster-and-bandage traction of the now old-fashioned Buck's extension apparatus is also usually quite unsatisfactory. Even if the excellent traction apparatus of Lemon or the powerful one of Lambotte reduces the overriding in a single sitting the plaster cast may fail to maintain the reduction. Hence there developed, in Europe, efforts to apply, more directly, continuous traction or distraction by the "closed," "semi-operative," and "open" methods that have been associated with the names of Codivilla, Steinmann, Lambret, Hackenbruch, Bradenheuer.

The immediate fixation of the deliberately exposed fractured ends is by no means new in surgery. The older, and still often and success-

Surgical Sociology

Ira S. Wile, M. D., Department Editor.

FRACTURES AND SOCIAL LOSS.

A new Workmen's Compensation Act has recently been passed by the New York State Legislature. The purpose of such an act is to provide a reasonable compensation to a workman or his family for the consequences of an industrial accident. Such accidents have been regarded as part of the cost of the product which should be shifted upon the community instead of permitting workmen to bear the expense and be subjected to undesirable forms of charity.

Among industrial accidents, fractures assume a prominent place. The cost of fractures regarded as a temporary disability is reflected in the expense necessary for the maintenance of ambulance services, surgical dispensaries, and hospitals. This does not take into account the possible loss of family independence resulting from the incurring of debts in order to take care of the patient, nor the wage loss resulting from the disability. The permanent effects of fractures with stiffness, shortening, or non-union, may result in the necessity of changing an occupation to one less remunerative or for which the sufferer is not specially adapted.

The larger questions of invalidity insurance and unemployment immediately arise to consciousness in contemplating permanent disabilities. The loss of the service of a vigorous male adult, owing to a permanent disability resultant from a fracture, may involve forcing the wife into industry or perchance deprive children of their rights in education and hasten them into occupations for which they received no preparation. There is a distinct wage loss and a loss in industrial efficiency, together with a complete lowering of family standards of living for which the community must pay directly or indirectly.

From the standpoint of litigation, it must be borne in mind that one-third to one-half the time of our courts is now spent in the trial of accident cases, wherein damages are sought.

In order to protect the community from these suggested anti-social results, it is necessary to lessen the frequency of accidents that cripple or destroy. The frequency of fractures among industrial accidents is sufficiently important to warrant particular attention to their prevalence and to the nature of the disability that results.

The experience of Austria for the years 1897 to 1901 indicates the following frequency of fractures and the nature of the disability.

Fractures	Disability		Death
	Temporary per cent.	Permanent per cent.	
Left arm	43.4	56.6	
Right arm	46.8	53.2	
Left forearm	49.8	50.	.2
Right forearm	50.9	48.7	.4

Bone, left hand	54.9	45.1	
Bone, right hand	58.8	41.2	
Thigh	17.8	79.7	2.5
Leg	40.	59.	1.
Collar bone, also injury of arms	49.7	50.2	.1
Ribs	57.	32.5	10.5

In the experience of Germany from 1904 to 1908, the injuries which required special treatment for 13 weeks of disability, presented these interesting figures for the fractures of bones:

1904	2,451	out of 10,989 accidents
1905	2,565	" 11,250 "
1906	2,627	" 11,034 "
1907	2,811	" 11,371 "
1908	3,275	" 12,569 "

The statistics of Great Britain for 1904 to 1908, listing the fractures occurring in workshops, indicate that the fractures of the limbs or bones of the trunks were 3,682 and fractures of the hand or of the foot were 3,091 out of a total of 143,097 total accidents.

Norway compensated during the years 1895 to 1899 for 1,448 fractured limbs out of a total of 9,320 accidents.

The prevalence of fractures among the non-fatal injuries which occurred to railroad employees in the State of New Jersey for the years 1888 to 1907 bears witness to the variation in liability to fractures according to the occupation of the workmen. The percentages of fractures among the injuries sustained among the different employees were as follows:

Laborers	11.0	Flagmen	8.7
Station men	9.1	Baggage men	15.
Freight conductors ..	8.3	Car repairers	4.3
Yard conductors	6.1	Roundhouse men ..	4.9
Conductors	5.9	Car examiners	5.6
Engine men	4.5	Car cleaners	6.6
Firemen	4.6	Freight handlers ..	8.1
Freight brakemen ..	4.1	Section hands	11.
Switchmen	6.8	Carpenters	8.9
Signal men	17.		

As further evidence of the frequency of occurrence of fractures in industry the figures of New York State for the years 1901 to 1906 indicate that fractures, producing temporary disability, formed 5.8% of all accidents.

Statistics might be adduced at greater length to accentuate the serious economic loss that results from the high accident rate, particularly insofar as fractures of the extremities are concerned. It is obvious, however, that fractures form but one phase of the industrial accident problem. The fact that fractures are not generally attended with mortality does not mitigate the economic, industrial, and social loss that they occasion. The problems of preventing fractures are merely those involved in the prevention of accidents in general. The maintenance of industrial efficiency demands the conservation of the workers. This does not mean merely the protection of the life of the workmen but the protection of their physical powers and the maintenance of their vigor, health and physical capabilities. To reduce the number of cases of fractures occurring in the industrial world would mean a step in the reduction of all in-

dustrial accidents. A fracture means not merely a break of a bone, but a break in the continuity of personal power, a break in industrial efficiency, a break, though small, in social development.

Book Reviews

A Manual of X-Ray Technic. By ARTHUR C. CHAMBERLAIN, Captain, Medical Corps, U. S. Army, Instructor in Radiology and Operative Surgery, Army Medical School, Washington, D. C. With 42 illustrations. Philadelphia and London: J. B. LIPPINCOTT COMPANY. Price \$2.00.

This is an elementary manual on the subject, especially prepared with a view to the needs of the medical service of the United States Army. For those who know little or nothing of the management of X-ray apparatus this is a good book with which to begin to learn, for the various parts are very clearly, concisely, and simply described.

Minor and Operative Surgery and Bandaging. By HENRY R. WHARTON, M.D., Surgeon to the Presbyterian and the Children's Hospital, Consulting Surgeon to St. Christopher's Hospital, etc., etc., Philadelphia. Eighth edition, enlarged and thoroughly revised. Small octavo; 576 illustrations. Philadelphia and New York: LEA AND FEBIGER, 1913.

Wharton's book is so well known that an extensive review of its many valuable qualities in its present form, the eighth edition, is unnecessary. The general arrangement is the same as that of the previous edition. A careful revision has been made, much obsolete material omitted, and considerable new matter and many new illustrations added. We continue to fail to see the purpose of including operations on the esophagus, stomach, intestines, kidneys, etc., in a work on minor surgery.

Year Book of the Pilcher Hospital. For the period from April 1, 1912, to March 31, 1913. Being the third year of the operation of the hospital. Brooklyn, N. Y.: Published by the DR. PILCHER.

In their introductory remarks the surgeons of the hospital state that there has been a steady increase in the demands upon the resources of the institution, indicating that its foundation was based upon a real need. Altogether 220 operations were performed, of which the majority were abdominal. It is perhaps correct to state that the most valuable of the contributions from the Pilcher Hospital is based upon studies of one of the conditions encountered 12 times in abdominal operations—membranous adhesions. Very interesting results have been attained by the Beer method of treatment of vesical papillomata. Many cases of carcinoma of the interest are reported by the surgeons of the Pilcher.

Pyorrhea Alveolaris. By THOMAS H. HARRIS, D.D.S., A.M., M.D., Member of the Academy of the Science of St. Louis, Member of the American Dental Association, Hospital of the School of Medicine, University of Kansas; Consultant at St. Margaret's Hospital, New York City. Illustrated. St. Louis: C. V. Mosby Co., 1913. Price \$2.00, cloth binding.

The subject of pyorrhea alveolaris has long been one of interest to dentists, but it has not been a subject of concern for the general physician. It is a subject which the ophthalmologist and the internist, however, should know. This book has a most interesting and instructive subject in an intelligent and concise manner, and it is a book that the pathologist and the general physician should read, for the treatment and cure of the various conditions

are methodically taken up, and the treatment is given by the author, supported by the illustrations. The pyorrhea alveolaris is a subject which has been a mental demon to many of the general physicians.

Contrary to the belief of many, the book is not that it is a "textbook" of the subject. It is a book that is built up of the facts of the subject, and we believe it is a book that is a most attractive and useful book.

Vicious Circles in Disease

M. A. M.D. (Harvard), Lecturer on Pathology, Harvard Medical School, Boston, Mass. Philadelphia: P. Blakiston, Son & Co., 1913. 100 pages. Price \$1.00.

As the title of this book indicates, it is a book that is built up of the facts of the subject, and it is a book that is a most attractive and useful book. The book is built up of the facts of the subject, and it is a book that is a most attractive and useful book. The book is built up of the facts of the subject, and it is a book that is a most attractive and useful book.

Vaccine and Serum Therapy

ed. by H. C. H. (Harvard), Lecturer on Pathology, Harvard Medical School, Boston, Mass. Philadelphia: P. Blakiston, Son & Co., 1913. 100 pages. Price \$1.00.

A comparison of the vaccine and serum therapy of four years ago with that of the present day is given in this book. The book is built up of the facts of the subject, and it is a book that is a most attractive and useful book. The book is built up of the facts of the subject, and it is a book that is a most attractive and useful book. The book is built up of the facts of the subject, and it is a book that is a most attractive and useful book.

While not intended to be an exhaustive treatise on the subject, it is a book that is a most attractive and useful book. The book is built up of the facts of the subject, and it is a book that is a most attractive and useful book. The book is built up of the facts of the subject, and it is a book that is a most attractive and useful book.

Epidemic Cerebrospinal Meningitis

M. A. M.D. (Harvard), Lecturer on Pathology, Harvard Medical School, Boston, Mass. Philadelphia: P. Blakiston, Son & Co., 1913. 100 pages. Price \$1.00.

This book is a most attractive and useful book. The book is built up of the facts of the subject, and it is a book that is a most attractive and useful book. The book is built up of the facts of the subject, and it is a book that is a most attractive and useful book. The book is built up of the facts of the subject, and it is a book that is a most attractive and useful book.

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Progress in Surgery

A Résumé of Recent Literature.

RECENT FRACTURE LITERATURE.

GENERAL PAPERS.

About a year ago there appeared two excellent commission reports on the treatment of fractures, one in England and one in America. The report of the Committee of the British Medical Association (*British Medical Journal*, November 30, 1912) regarding the treatment of fractures, is supplemented by an excellent article from the pen of ROBERT JONES of Liverpool dealing with the same subject (*British Medical Journal*, December 7, 1912). "The Report of the Commission on End-Results of Fractures of the Femur," by W. L. ESTES, in the *Pennsylvania Medical Journal*, December, 1912, while of narrower scope, may be applied to treatment of fractures elsewhere.

The gist of the conclusions indicates that the non-operative measures for treating fractures which are already at our command, have, in general, not been utilized to anything like their full possibilities. Only after these have all been exhausted, should operative treatment be considered.

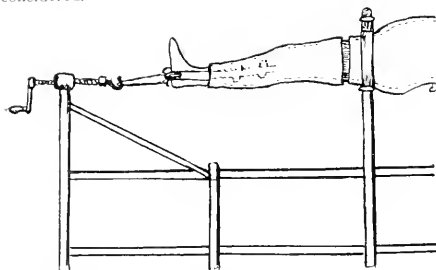


Fig. 1. Codrville's plaster cast and nail extension method.

Taken together, these three papers constitute a most concise collection of valuable information concerning the non-operative treatment of fractures in general.

THE REDUCTION OF FRACTURES UNDER LOCAL ANESTHESIA.

This is not a new subject. The procedure was first employed by Conway, an American, more than twenty-five years ago. Local anesthesia is employed more extensively in Europe than here. For example, this type of anesthesia is used in 60 per cent of all operations at Wilms' clinic in Heidelberg. In the treatment of fractures as well as in general surgery, the tendency is to use local anesthesia wherever possible. BRAUN, in Germany (*Deutsche Med. Woch.*), 1913, p. 17, and QUESU, in France, both use a long thin needle through which they inject a suitable quantity of local anesthesia around each end of the broken bone.*

DOLLINGER of Buda-Pesth (*Zentralblatt f. die Gesamte Chir. u. ihre Grenzgeb.*, 1913, Band 1, page 175) describes reduction of fracture of both bones of the leg under local anesthesia with the aid of the fluoroscope. In his clinic the anesthetic is injected either around each end of the broken bone or a circular anesthesia is established by infiltrating the limb at a suitable level proximal to the site of fracture (*Zentralblatt f. Chirurgie*, 1913, page 763). A most accurate method for blocking the brachial plexus was devised by KULENKAMPFF in 1912 (*Zentralblatt f. Chirurgie*, 1911, page 1337). The needle is introduced just above the clavicle. (For details of technique see account in original article.)

In Germany this method has gained wide acceptance. In G. Hirschel's book on local anesthesia (published by Bergmann, Wiesbaden, 1913), Kulenkampff's method is

*This method is also described in Braun's book, third edition, published by Barth, in Leipzig, 1913.

given the preference in fractures and dislocations of the upper extremity, while, on account of the less perfectly developed method of anesthetizing the lower extremities by blocking of the nerves, the application of local anesthesia to the end of the broken bone is advocated, especially in Pott's fracture.

EXTENSION METHODS.

These are chiefly important in treating fractures of the lower extremities, especially fractures of the femur. In



Fig. 2. Steinhmann's nail extension.

skilful hands, excellent results may be obtained with the time-honored Buck's extension, Hodgen's suspension splint or Sayre's double oblique splint. In all of them, the bandages loosen, consequently one must be willing to devote plenty of time and consideration to their daily readjustment.

The muscles of a limb enjoy maximal relaxation when that limb is in the position of *semiflexion*. This principle was known to, and was mentioned by, Sir Astley Cooper. Probably every authority on fractures, before and since

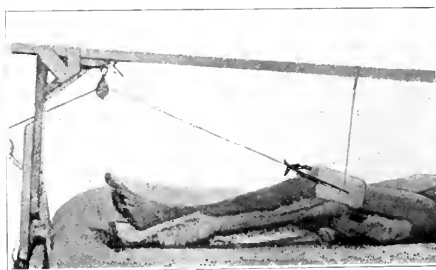


Fig. 3. Steinhmann's nail extension applied.

his time, has known it also. Since its rediscovery by ZÜPPINGER in Germany a few years ago, semiflexion is the position in which traction is applied to fractured limbs in most of the clinics in that country. The acme of the adhesive plaster extension method has been reached by the

the first of these methods was the use of the "Hager" method, which was described in the 1933 paper. The method was based on the use of a "Hager" device, which was a long, thin, flexible rod with a handle at one end and a hook at the other. The hook was used to grasp the teeth and pull them into alignment. The method was described as being "simple and easy to use" and "very effective". It was also described as being "very safe" and "very reliable". The method was described as being "very effective" and "very reliable". The method was described as being "very effective" and "very reliable".

In 1943, the "Hager" method was described as being "very effective" and "very reliable". The method was described as being "very effective" and "very reliable". The method was described as being "very effective" and "very reliable". The method was described as being "very effective" and "very reliable".

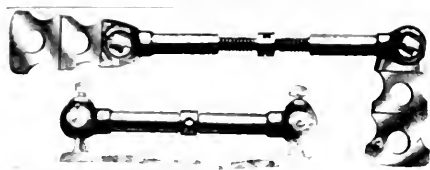


Fig. 1. Hager device.

a general method for the treatment of the teeth. The method was described as being "very effective" and "very reliable". The method was described as being "very effective" and "very reliable". The method was described as being "very effective" and "very reliable". The method was described as being "very effective" and "very reliable".

In some of the methods described, the teeth were pulled over the skin of the face. The method was described as being "very effective" and "very reliable". The method was described as being "very effective" and "very reliable". The method was described as being "very effective" and "very reliable". The method was described as being "very effective" and "very reliable".

In 1947, the "Hager" method was described as being "very effective" and "very reliable". The method was described as being "very effective" and "very reliable". The method was described as being "very effective" and "very reliable". The method was described as being "very effective" and "very reliable".



Fig. 2.

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The method was described as being "very effective" and "very reliable". The method was described as being "very effective" and "very reliable". The method was described as being "very effective" and "very reliable". The method was described as being "very effective" and "very reliable".



two inches of the ankle. Incorporated in it are the vertical bars of a strap-iron stirrup which extends well below the heel, while one inch proximal to the cross bar of the stirrup is a second cross bar. At its center is a thumb screw. Strong laces from the eyelet holes of the felt ankle all lead to this thumb screw, the tightening of which consequently makes traction. PATEL'S article* describes a similar method lately invented by JABOULAY where traction is made upon a shoe plate instead of a felt ankle. G. GIAQUINTA (*Gaz. degli osp. e delle chir.*, 1913, p. 13) also advocates ambulant treatment with extension.

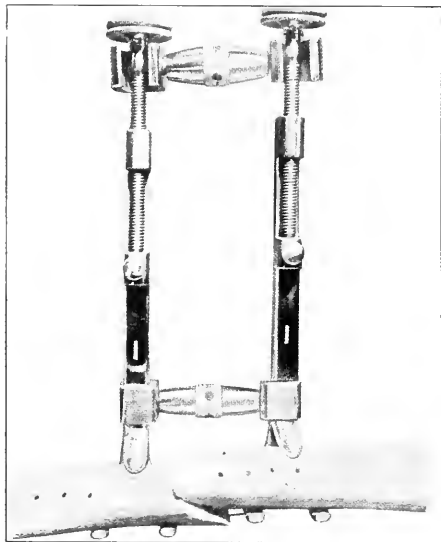


Fig. 7. Gerster's turnbuckles applied to Lowman's bone clamps, reducing fracture of femur.

To return to Steinmann's Nail Extension method (*Neue Deutsche Chirurgie*, Band 1, 1912, *British Medical Journal*, November 30, 1912, page 1235; J. C. A. GERSTER, *American Journal of the Medical Sciences*, August, 1913, page 157), space does not permit a detailed description of it here; but the advantages it possesses over other traction methods deserve mention.

In the first place one need not be in a hurry to apply it. There is no disadvantage in waiting for intercurrent diseases such as delirium tremens or pneumonia to run their course, or for abrasions and contusions of the broken limb to heal before application of the nail extension. Once properly applied, very little time need be spent in the daily inspection and care of the case. Massage of the thigh and passive motion of the knee joint may be begun as early as the fifth day after extension. There is little if any pain, and there is no decubitus. The danger of infection is extremely small if the rules laid down by Steinmann are followed. Nail extension is an aid to operative treatment will be referred to later.

LAMBRETT in fractures of both bones of the leg transfixes the upper and lower fragments with nails placed well away from the site of fracture. Distraction is effected by turnbuckles which engage the ends of the nails (Fig. 5). The Lambrett and Steinmann method have been combined. Nail extension is a comparatively new thing in America. Modifications and improvements naturally suggest themselves to the reader's mind. Before claiming priority for such ideas, it would be well to peruse the original monograph of Steinmann which contains a num-

ber of such improvements and the reasons for their being discarded.

OPERATIVE TREATMENT.

Because of the effective traction afforded us by nail extension, the operative indications for treating recent fractures have narrowed down to the cases with interposition of soft parts in fractures of the shafts of long bones, and irreducible displacements in fractures around the joints. The object of operation is to secure accurate anatomical reposition of the fracture.

LAMBOTTE'S book on the Operative Treatment of Fractures is the most important communication on this subject of the year 1913. (Lambotte, *Chirurgie Operat. des Fractures*, Masson, Paris, 1913.) He is not wedded to one method, but adopts the various means at his command to suit the individual case. Important points in his technique will be referred to below.

Asepsis. Infections coming on after clean bone operations are absolute indications that the clinic in which they have occurred is imperfect in its aseptic technique, not-

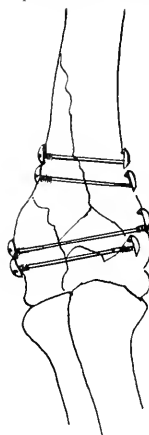


Fig. 8. Lambotte's bolts applied to comminuted fracture.

withstanding what may be said to the contrary. As a rule, the fault lies neither in the preparation of the patient nor in the preparatory disinfection of the surgeon and his attendants. It is failure to avoid infection, once the operation is begun, which constitutes the cause of non-success. For example, visitors may crowd around the operator and his assistants whose elbows become infected by contact with the clothes of the spectators; an arm whose elbow is infected, reaches across the wound for an instrument and brushes either the other instruments upon the table or the dorsum of the other hands at the wound. This is merely an example of one of the commonest breaks in technique. A long article might be written upon this subject.

Freeing of Fragments.

In the *Annals of Surgery*, October, 1912, the reviewer described how, after cutting down to the bone, the limb could be flexed at the site of fracture, and retractors could be inserted into either fragment, to draw them apart as they were gradually freed by small repeated cuts against the bone. In this way in fractures of the femur, the attachments of the linea aspera are freed from either fragment for an inch or two. This method saves much time and facilitates the control of hemorrhage.

Once these are freed, the reduction of fragments may be accomplished in one or several ways. (1) In the well-known LEMON-MUELLER apparatus the pelvis is fixed and traction is made upon the foot.

(2) Lambotte has a far simpler method: A perineal crutch with a lever and foot plate (Fig. 6).

(3) McGLANNAN of Baltimore (*Surg. Gyn. & Obst.*, Vol. 16, 1913, p. 429) uses the Steinmann nail method for traction.

*Patel, *Progress. Med.*, 1913, p. 286.

(4) Turnbulb's *Interlocking* device, which is described in the reports of the members of the Fracture Club of the University of Chicago, and is described by GORDER in the *Annals of the New York Academy of Medicine*, and by G. H. GORDER in *Archives of Surgery*, October, 1913.

The method is described in these two reports as being essentially the same in principle, each of the fragments of the fracture being held in place by a number of small pins. However, an improvement in this method is described in the *Annals of Surgery*, November, 1913, in which the necessity of the use of pins is eliminated by an ingenious operating technique.

Detention Apparatus.—S. J. LIGER has described a method for holding together the small fragments of the fragments of fractures around the elbow joint. The fragments are held in place by Landolt's *Detention Apparatus*, which binding the fragments together, allows them to heal, which have been turned to a more favorable position. In fractures of the neck of the radius, the radial transfix the great transverse fragment, thus holding the fragments in their proper relation (1875).

In fractures of the shafts of long bones plates are frequently used, then either wire loops or the so-called tough elastic Vanadium steel plates. Since the introduction of self-tapping, machine-threaded screws, the use of plates has improved over the old brittle plates and the wire loops, which at first were used. The reviewer has never seen one of these Sherman screws held. The strongest plate so far devised has been recently published by SORRISSE in the *Annals of Surgery*, November, 1913, page 653. It is L-shaped on cross section and is designed for transverse fractures only. A slot is cut into the bone by a special saw, and into this, one-half of the plate is both bent and screws hold it in place.

In oblique fractures of the femur, among others, MERRILL of London uses steel bands to hold the fragments in place. It does not seem possible to tighten wire loops as effectively as such bands, and for this reason and because it is rather high wire, has not been used very extensively.

Ivory pegs, plates and screws have been used both here and abroad. They have not found widespread adoption. They possess the advantage of being absorbable and the disadvantage of being weak.



Fig. 9. Sherman's plate, which is bent and held in place by screws.

The intramedullary bone splint is rarely used in recent fractures, but is often employed in cases of nonunion. The intramedullary metal splint, usually of aluminum (FISHER), has fallen into disuse.

The external bone clamp of PARKHURST of America and of LAMBORTE of Belgium, are practically the same in principle. THOMAS of Denver still advocates their use, but Lamborte would not give them up. It is well known principle that the larger the area of contact between the bone, the faster it will heal. In the case of a compound fracture, the small pieces of the bone are worked in two or three weeks, and the fragments are held by the Lamborte clamp held in place by a wire which is secured by a plaster cast and the limb is extended. The fragments are immobilized by the plaster cast and the limb is extended. It is not easy to see how the fragments will be held in place, but satisfactory results are obtained in many cases. In fractures we possess a great variety of methods.

The operative treatment of fractures of the femur is described in the following table.

In some cases, the fragments are held in place by a wire loop, and the bone is held in place by a wire loop.

W. A. LIGER, M.D., of the University of Chicago, has described a method for holding together the small fragments of the fragments of fractures around the elbow joint.

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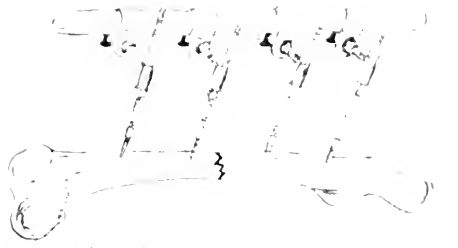
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GRIFFIN (*Medical Record*, 1913, page 650) reported a case of sarcoma of the femur following plating for fracture.

JOHN C. A. GERSTER.

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HEAD.

Diagnosis of Fractures of the Skull.

C. E. Dennis, *Austral. Med. Jour.*, 1913, No. 101, p. 1090

W. H. Stewart, *Arch. of Roent. Ray*, p. 346, 1913.

Typical Fractures of Bones of the Face.

Korte, *Deutsch. Med. Woch.*, 1913, p. 253.

SPINE.

Operation for Fractures of the Spine.

C. A. Elsberg, *Annals of Surgery*, 1913, Vol. 58, p. 296

EXTREMITIES—GENERAL PAPERS.

Mechanics of Fractures

Emmet Kixford, *Jour. A. M. A.*, Vol. 61, p. 916.

Chronic Periostitis from Overexertion (leading to rarefaction and spontaneous fracture).

Wolff, *Deutsch. Zeitsch. Militarärztl.*, 1913, Bd. 14, p. 548.

Multiple Spontaneous Fractures in a Case of Osteosarcoma of Lobstein. (There were 18 spontaneous fractures in a period of 19 years; for a year under administration of adrenalin, no fracture has occurred.)

L. Plisson, *Clinique*, 1913, p. 132.

(For spontaneous fractures, see also under Femur.)

Intra-uterine Fractures.

R. R. Smith, *Surg. Gyn. & Obst.*, 1913, Sept., page 344

Hist. of Surg. of Fractures.

Lambotte, *Belgique Med.*, 1913, p. 387.

Experimental Lengthening of Bones by Open Operation.

Magnuson, *Surg. Gyn. & Obst.*, July, 1913, p. 63.

Negative Pressure within Bones—Its Relation to Fat Emboli.

Rothmann, *Munch. Med. Woch.*, 1913, p. 1664

Function of the Periosteum in Bone Transplants.

C. A. McWilliams, *Surg. Gyn. & Obst.*, 1914.

Regeneration of Bone.

Hass, *Surg. Gyn. & Obst.*, 1913, Vol. 17, p. 164

Petroff, *Zentralbl. f. die Gesamte Chir.*, etc., 1913,

Bd. I, p. 277.

Fracture Treatment in Dispensary.

Skellern, *Internat. Clinics*, 1913, p. 190

Landmarks in the X-ray Picture Indicating Correct Reduction in Colles and in Potts Fractures. (The centre line of the radius projected should pass between the 2nd and 3rd metacarpal bones; the centre line of the tibia should exactly bisect the talus.)

E. H. Skinner, *Arch. of Roent. Ray*, 1913, p. 345; *Am.*

Quart. of Roentgenolog., 1913, p. 142.

UPPER EXTREMITY.

Fractures of the Elbow Joint.

Th. Voelker, *Med. Klin.*, 1913, pp. 441 and 489.

Hyperextension and Backfire Injuries of the Wrist.

C. S. Wallace, *Lancet*, 1913, p. 819.

LOWER EXTREMITY.

Pelvis—Fracture of Floor of Acetabulum, etc.

Pancoast and Skillern, *N. Y. Med. Jour.*, 1913, p. 1288.

Neck of Femur.

Whitman, *Lancet*, Vol. 184, p. 1649.

Bardenheuer (see Extension).

Cruet et Moure, *Bull. et. Mem. de la Soc. Anat. de*

Paris, p. 17.

Trochanter.

A. C. P. Ashhurst, *Ann. of Surg.*, Oct., 1913, p. 494.

Roth, *Ergeb. d. Chir. Orthop.*, Bd. 6, p. 109, 1913.

Atrophic Femur.

Brandes, *Max. Beiträg. z. K. Chir.*, 1913, p. 651.

Lejars, *Semaine Méd.*, 98.

Knee Joint.

Blake, *J. B.*, *Ann. of Surg.*, Vol. 58, p. 27.

Binney and Lund, *Boston Med. & Surg. Journ.*, p. 49.

Patellae (both).

Steinke, *C. R.*, *Boston Med. & Surg. Journ.*, p. 510.

Spine of C. R.

Jones, Robert, and S. A. Smith, *Brit. J. of Surg.*, Vol. 1,

No. 1, p. 70.

Tibia.

Destot, *Lyon Chirurg.*, 256 and 391, Vol. —.

Calcaneum.

Soubeyrau and Rivès, *Rev. de Chir.*, p. 429, Vol. —.

Reiner, Hans, *Zeitschr. f. Orthop. Chir.*, 1913, p. 155.

Scaphoid.

Horwitz, A. E., *Ann. of Surg.*, Vol. 58, p. 526.

General Principles for the Management of Fractures.

W. L. ESTES, South Bethlehem, Pa. *Medical Times*, December, 1913.

In this article, which is designed as a guide for the general practitioner, Estes lays down a number of important rules to be observed in the treatment of fractures. Among them are the following:

First aid in fracture cases: The first consideration is the utmost care in handling the individual and the injured member so as to minimize shock. After assuring himself that the ends of the fragments are not so placed that they endanger the skin or some important structure, the physician should fix the limb in the position in which it is found. Never attempt to reduce the end of a projecting bone in a compound fracture, but try to keep it from getting back under the skin until it has been thoroughly cleansed and disinfected.

In the opinion of the author it is almost always necessary to give an anesthetic during reduction. In beginning traction for reduction always extend first in the direction of the axis of displacement. Molded plaster-of-paris splints are the best, as they can be adapted to the particular fracture and to the individual contour of the fractured part.

Two factors enter into the ideal issue of every fracture case, namely, first, the result should be the restoration of the complete function of the extremity; second, the limb should show no distortion nor any marked deviation from the normal. Estes believes that both of these results are rarely attained. No fracture of any degree of seriousness should be treated without the use of the Roentgen rays.

Traumatic Dislocation of the Hip in Children. (Beitrag

zur Traumatichen Hüftgelenksluxation bei Kindern.)

E. BOEHNEKE, Halle. *Archiv. fuer Klinische Chirurgie*, November 5, 1913.

Traumatic dislocation of the hip, uncommon at any age, is very rare in childhood. The injury in young individuals generally results in diaphyseal separation at the upper end of the femur. The author has collected twenty-nine cases of dislocation in childhood and reports an additional one that is quite typical of most of those previously described. The patient, a healthy boy five years old, fell from a height of several feet and was found unconscious. Two months later, after varied treatment for the condition of the hip had been applied, he was taken to the clinic. There was a deep depression in the left inguinal region; the left leg was in a position of inward rotation, flexion, and adduction. The great trochanter was displaced above Nelaton's line, and was much nearer the anterior superior iliac spine than on the normal side. The femoral head, absent in the normal position, was distinctly felt in the posterior surface of the ilium. An actual shortening of the left leg (3 cms.) was determined. X-ray examination established the diagnosis.

Two vigorous attempts to reduce the dislocation under narcosis failed. An open operation was therefore performed. The incision was carried between the fibres of the glutei to the femoral head. The latter was found firmly imbedded in scar tissue, but free from any serious damage; a new cavity for the head of the bone had not yet formed. Upon exposing the acetabulum it was found filled with massive inflammatory tissue. This was removed with considerable difficulty and the surgeon found it impossible to avoid excising some of the underlying cartilage. Reduction of the head of the bone still remaining impossible, the capsule had to be partly divided and the musculature subperiosteally separated from the great trochanter. The reduction was then readily accomplished. The musculature was sutured in place and the capsule closed.

Although several attempts at early mobilization of the hip-joint after the operation were made, almost complete fixation was the final outcome. Roentgenographs showed that the head of the femur was in the normal position.

The procedure for and the results of this case of old dislocation of the hip in a child correspond with the other similar cases reported in the literature.

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STRAIGHT DIRECT LARYNGOSCOPY, BRONCHOSCOPY, AND ESOPHAGOSCOPY

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nan Hospital for Crippled
Children

BALTIMORE, MD.

CHAPTER I.

INTRODUCTION.

Since the examination of the larynx, bronchi and esophagus by the direct method requires a steady hand and extraordinary skill in handling instruments, it is imperative that the beginner should practice on the dummy and on animals before attempting to pass the tubes on the human subject. A good knowledge of the anatomy of the parts should be acquired in the dissecting room, for on it depends the successful solution of the many problems which will present themselves to the bronchoscopist. After one becomes expert, the handling of the instruments is secondary to that confidence which is born of a thorough anatomical study. At the beginning, let it be understood that to learn direct laryngoscopy, bronchoscopy and esophagoscopy well means hours of hard work and disappointment. But one who is ambitious and persevering may rest assured that success will eventually be his. In order to have a clear understanding of what is before one, it will perhaps be better to describe briefly the instruments which are used in the direct examination of the respiratory tract and the esophagus. The two classes of instruments are those devised by Jackson in this country, and have the light on a light carrier at the end of the tube and those of Lillier and Brühl, which depend for illumination on an electric arc light or an electric glow.

The Jackson instruments consist of:

One laryngoscope carrying 10 mm. in length and 10 mm. in the inside diameter for adults

One laryngoscope carrying 10 mm. in length and 12 mm. in the inside diameter for children with normal airway and without hyperplasia of the tonsils and adenoids, which will be excluded by the use of the laryngoscope.

One bronchoscope carrying 10 mm. in length and 7 mm. in the inside diameter for the extra large tube in adults.

One bronchoscope carrying 10 mm. in length and 7 mm. in the inside diameter for children.

One bronchoscope carrying 10 mm. in length and 7 mm. in the inside diameter for children.

One bronchoscope carrying 10 mm. in length and 4 mm. in the inside diameter for children.

One esophagoscope carrying 10 mm. in length and 7 mm. in the inside diameter for children.

Three probes of different lengths for larynx, bronchi and esophagus.

Three hooks of different lengths for larynx, bronchi and esophagus.

Six cotton carriers for the larynx and bronchi, supplied with screw cuts to hold the cotton securely.

Six cotton carriers for the esophagus supplied with narrow cuts.

One double dry cell battery for lighting the small lamps. The battery has four cells on each side which makes it possible to light two tubes at the same time, the advantage of which will be explained further on.

One tracheal speculum 17 mm. in length and 8 mm. in the inside diameter for use through a tracheostomy and a tracheotomy.

One tracheal speculum 14 mm. in length and 8 mm. in the inside diameter.

One tracheal speculum 14 mm. in length and 8 mm. in the inside diameter.

One tracheal speculum 14 mm. in length and 8 mm. in the inside diameter.

One tracheal speculum 14 mm. in length and 8 mm. in the inside diameter.

the various tubes. As a necessary equipment, Brunings gives

1. The endoscope with supplementary lamp and aseptic cord.

2. The double extension tubes Nos. 1-5. No. 1 (14 mm.) for esophagoscopy. No. 2 (12 mm.) for bronchoscopy, with a second long unperforated sliding tube for esophagoscopy. Nos. 3-5 (10, 8.5, 7 mm.) for bronchoscopy.

3. Two autopsy spatulae of 13 and 11 mm. diameter. One autopsy spatula for children.

4. Special bougies for 1, 2 and 3.

5. Two bronchoscopic forceps, 25 and 35 cm. long with five interchangeable end pieces.

6. One esophagoscopic forceps, 50 cm. long with two interchangeable end pieces.

7. A saliva pump with three tubes, 25, 35 and 50 cm. in length.

8. Two hooks for foreign bodies.

9. One dozen double wool carriers. And unless the utmost economy is demanded, he recommends in addition

10. One extension tube of a diameter between Nos. 4 and 5—that is about 7.75 mm.

11. One counter pressure instrument (useful with operative instruments).

12. One short special strong clutch forceps for foreign bodies firmly fixed at the entrance to the gullet.

13. A combined syringe and drug applicator.

14. A glass jar for keeping the forceps in soap suds.

15. Rectangular spatula for trial autopsy.

16. One very delicate forceps, 17 to 18 cm. long without end pieces for children.

17. Endoscopic telescope.

18. Prism for double eye piece for two observers.

19. A dilating extractor for foreign bodies embedded in the gullet.

20. A dilating extractor for foreign bodies behind bronchial stenoses.

21. Concentric metal bougies for broncho-intubation.

22. Tracheograph tracheometer.

23. Counter pressure autoscope for endo-laryngeal operations under general anesthesia and special operating instrument.

24. Dynamometric dilator for cardiac end of stomach and upper end of gullet.

25. Speculum instrument for endoscopy in children (electroscope for children).

26. Tracheal funnel.

27. Forceps for children.

28. Autoscope for direct autoscopic of the larynx.

29. Operating instruments with special objects.

30. Forceps.

31. Loop extractor.

32. Collar stud forceps.

33. Medicament applicator.

This outfit is mentioned to show the multiplicity of instruments which some men consider necessary for successful work and which tends to frighten those who would take up bronchoscopy. Besides Jackson's instruments mentioned above, the writer has found the modified laryngoscope, measuring 17 cm. in length and 10 mm. in the inside diameter, particularly valuable. It will be referred to in detail under direct laryngoscopy. Other instruments in Jackson's outfit which are needed occasionally are the safety pin closer, the peanut extractor, forceps for dilating a stenosis in front of a foreign body and a pin finder. In buying an outfit, it is a mistake to economize though one does not need all the instruments enumerated by Brunings. It is difficult to decide which of the two outfits is the better. Having worked with Jackson's instruments, the writer prefers them. The mirror

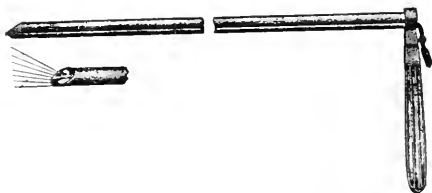


Fig. 1. Jackson's Self-Illuminating Tracheobronchoscope.

in Brunings' handle has a slit in it and it is difficult to learn to work through it after having used the open tubes. The use of a suitable chair and table is important and will be referred to under the writer's special methods. In certain bronchoscopic and esophageal cases, increased secretion is a serious hindrance and it is necessary to pump it out. At the Presbyterian Hospital a water pump attached to a spigot is used successfully for this purpose. As a part of any outfit, there should be tracheotomy instruments because one never knows when he will be called upon to open the trachea.

Forceps. Special attention will be directed to forceps because, next to the tubes, they are the most important instruments for the bronchoscopist. The three types commonly in use are those of Jackson, Brunings and Pfau. The Jackson forceps has a scissors handle into which fit the different length tube bits for the larynx, bronchi and esophagus; they are satisfactory for the 10, 9 and 7 mm. tubes but are too large for the smaller bronchoscopes. In addition to the foreign body tips, there are vari-

ous shaped tips for removing tumors, etc. (Fig. 8). H. Large of Cleveland has devised a pair of forceps to fit the snare-handle which is small enough for the 5 and 4 millimeter bronchosopes. Brunnings' extension forceps is a satisfactory instrument because it is slender enough for the smallest tubes and the handle is curved out of the line of vision. As its name implies, it can be made longer or shorter, and is essentially a foreign body forceps. It has various tips, the most useful of which according to Brunnings is the "claw tip." Another useful tip is that devised by McCoy for clamping and removing open-safety pins. Pfaff's model is the ideal instrument for rough work such as the removal of tumors, specimens for microscopic examination, etc. They are the best forceps for impacted foreign bodies. Into the handle fit the different lengths of tubes. It is the instrument of choice for larynx work and for the removal of foreign bodies through the 9 mm. tube.

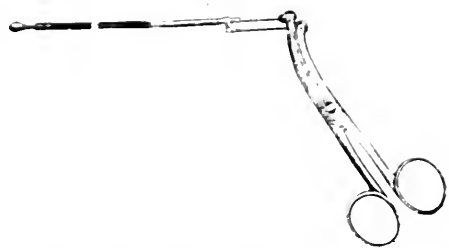


Fig. 8. Forceps, Large of Cleveland. (Fig. 8. Large of Cleveland.)

Practice with the different sized tubes on the dummy suggested by Well is essential to avoid the mistakes of instrument makers. The dummy is not without its cost, but as it represents the larynx, trachea and bronchi with bronchosopes and tubes passing two tubes and trying all sorts of positions, it is well worth the cost. Animals are easily anesthetized with all doses of chloroform and hyoscine and in this condition are suitable for all purposes. While passing the tube, remember to use more force in animals than in the human larynx, and be slow to handle instruments and to extract tubes from the trachea and be slow to withdraw tubes from the lungs. The writer was asked the question, "How can the removal of foreign bodies be accomplished?" The ability of the extirpator and the use of the grasper should give the student a good idea of the work through the tube passed on the dummy. For the same reason, the grasper should be practiced through the tube, especially in the removal of foreign bodies. The removal of foreign bodies is a most important preliminary work in

bronchoscopy and the student should carefully attempt to remove foreign bodies from the dummy. The student should be warned that the removal of foreign bodies is a most important preliminary work in bronchoscopy and the student should carefully attempt to remove foreign bodies from the dummy. The student should be warned that the removal of foreign bodies is a most important preliminary work in bronchoscopy and the student should carefully attempt to remove foreign bodies from the dummy.

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gосcopy except in the case of a sharp foreign body or a pin. The patient is simply held and the examination made as will be described later. In older children up to 8 years of age, no anesthetic is used for direct laryngoscopy and the examination of the upper end of the esophagus; for bronchoscopy and deep esophagoscopy, ether is given after a preliminary injection of atropine. In adults practically all examinations of the larynx, the bronchi and the esophagus are made under alypin anesthesia. If the examination is to be a long one, the patient is given atropine. The former method of giving morphine hypodermically has been discontinued except in very nervous individuals. While no bad effects except nausea have been noticed, its use is unnecessary in most patients. The writer has never tried to do direct laryngoscopy, bronchoscopy and esophagoscopy without local anesthesia as has recently been advocated by a prominent bronchoscopist. While some patients may tolerate the tubes without anesthesia, the average patient in the average clinic will be more tractable if he realizes that one is doing all he can to prevent pain. And with such a safe anesthetic as alypin, the slight increase in time is a small consideration.

Method of using local anesthetics. Alypin and



Fig. 3. Jackson's Forceps, Curved Jaws Jackson's Forceps, Cupped Jaws.

novocain are used in 20 to 30 per cent. solutions. When time is a factor, 30 per cent. solution is used. Usually 20 per cent. solution answers every purpose. With a curved applicator the anesthetic is applied to the pharynx and base of the tongue and to the larynx if possible. After waiting one or two minutes, the direct laryngoscope is passed and the epiglottis pulled forward. Another application is then made directly to the larynx. No effort is made to squeeze the excess of the solution out of the cotton because it does no harm. In a few minutes the larynx is ready for prolonged examination. If the trachea is to be examined, an applicator loaded with 20 per cent. solution is passed down through the laryngoscope to the bifurcation or a 4 per cent. solution is sprayed into the trachea. In esophageal examinations one application of 20 per cent. solution is made. Though alypin has not been tried in children, the writer feels sure that it can be used safely. In some adults enormous doses have been used with no after-effects. When it is necessary to use general anesthesia, ether is pre-

ferred. When given warm it probably has no more serious effect upon the lungs than chloroform. A very useful drug to decrease nervousness and irritability, especially if given in full doses a day or so before the examination is bromide of soda. The writer has used it with the greatest success in patients who balked at the first examination. In all tube work under ether it is well to have an oxygen tank in readiness for emergency. In Brunings' work on bronchoscopy there is a table which illustrates so well the more prevalent use of general anesthesia in Europe than in this country that it is well worth inserting in a monograph of this kind. American operators are gradually getting away from general anesthetics as greatly increasing the dangers of tube work. It is the exception that an expert bronchoscopist gives a general anesthetic in examining or operating in the larynx. In esophagoscopy it is certainly the exception unless sharp foreign bodies are to be removed and in bronchoscopy it is being used less and less in children under 6 years of age. Brunings says: "In order to give a true idea of the practical significance of anesthesia when the indications are correct, I insert a small table which shows the frequency of or rarity of their use in the direct examination and operative performances during recent years in Kilian's clinic. In judging of these numbers it must be borne in mind that they have reference only to clinical cases. All instances of endoscopy on practised persons and for the purpose of teaching and demonstrating are excluded. On the other hand, in most examinations the duration of the operation has been increased in consequence of demonstrating for doctors or students."

CASE PERCENTAGE OF GENERAL ANESTHESIA.

Nature of examination.	Over 10 Years.		Gen-eral.
	10	Under 10	
Direct laryngoscopy	0	57	18
Upper tracheoscopy	0	100	4.4
Upper tracheo-bronchoscopy ..	3	100	22
Lower tracheoscopy	0	0	0
Lower tracheo-bronchoscopy ..	?	?	(6)
Direct hypopharynxgосcopy			
and esophagoscopy	3	90	6.5

"It will be seen from the first vertical percentage column that in the case of adults including children over 10 years of age anesthesia was resorted to very rarely and only for upper tracheo-bronchoscopy and direct esophagoscopy. They were mostly cases of timid children or patients with a lesion which would render examination painful. The middle collection shows that in the case of little chil-

A PLEA FOR THE EARLY SURGICAL TREATMENT OF INTUSSUSCEPTION.*

A. R. MATHENY, M.D.,
Surgeon to Pittsburgh Hospital,
Pittsburgh, Pa.

In the treatment of intussusception there are but two available methods: the first by taxis and inflation of the colon either by water or air, with or without an anesthetic; and the second by laparotomy with reduction of the invagination by direct palpation or, if that is impossible, by resection of that portion that is gangrenous or that will evidently become so.

While it would be inadvisable in some instances not to attempt the bloodless method providing the diagnosis be made very early and the case be one of the colic or ileocecal variety, yet the lives of the patients who have come to us for operation, would have been jeopardized by such procedure as, with one exception, plastic exudate had already formed, which precludes reduction without direct palpation of the intestine.

The opponents of operation in this condition will endeavor to show that although by bloodless method the mortality is about 70%, that the operative treatment will give a mortality in all of about 65%. But if one will analyze the latter statistics, he will find that the great majority of fatal cases were cases that required resection of the bowel.

Since 75% of all cases of intussusception occur in the first two years of life, and 50% of this number in the first year, the mortality of resection is readily explained, for the young child will stand lengthy intestinal operations but poorly, and intestinal resection is an extremely severe operation at any age.

To emphasize this point I beg to quote the following statistics of resection for intussusception compiled by Dowd¹, which show the futility of waiting until resection is the only recourse.

In Chubb's Australian series of 127 cases, there were eight resections with one recovery.

In Eccle's St. Bartholomew's Hospital report of 89 cases, there were nine resections with no recovery.

Makin's reports 202 cases with 12 resections, giving two recoveries, both in adults.

Koch and Oerum report in 400 cases in Danish children eight resections with no recovery.

So it is seen that the cases which progress to the condition requiring resection, are practically hopeless.

If the pathology of the condition were but born in mind, the danger of gangrene rapidly ensuing would be evident. The mesenteric vessels are rapidly compressed by the enveloping bowel becoming edematous, converting the neck of the invagination into a constricting ring. Rapidly following, there are adhesions forming between the four or more peritoneal layers involved and finally gangrene of the intestinal walls.

Treves² has divided the condition clinically into the (1) ultra acute, (2) acute, (3) sub-acute and (4) chronic. Upon seeing a case, particularly in children, it is obviously impossible to tell without opening the abdomen in which category the case will belong.

To temporize in the acute and ultra-acute types means gangrene, and probably fatal peritonitis.

I have previously reported³ eight cases of intussusception in children with two deaths: one of which was resected, having gone 72 hours. The other case was an infant of eight days which expired as the incision was made. I have since had two cases, boys of 6 months and 3 years, respectively, with successful outcome; making a total of ten cases with a mortality of two, or 20%.

The favorable results are due to the fact that all the cases were operated upon in the first 10 hours, with the exception of the girl who required resection, and whose case had progressed about 72 hours. The infant of eight days had never had a successful bowel movement.

The youngest of the series of 8 successful cases was 5 weeks, and the oldest 3 years. Of these cases seven were boys.

Koch and Oerum⁴ report 400 cases in Danish children in which 60% occurred in the first year; of these two-thirds occurred in the 5th to 7th month. During the second year no more cases occurred than in the 5th and 6th month. The frequency of the condition decreases rapidly with advancing age. The proportion of the boys to girls was 2.2 to 1. They show under the first year that 52% died without operation, and that the operative mortality of the balance was 74%. Upon analyzing their deduction we find that in a vast majority of cases the bloodless method had been tried and they advise such treatment for at least 12 hours.

To the family physician must be given credit for the early or late interference by the surgeon, for upon his diagnosis rests the proper early treatment.

Too much importance can not be placed on the digital examination of the rectum and bimanual recto-abdominal examination in all cases of acute abdominal pain in children.

*Read before the Allegheny County Medical Society, June, 1913.

the periosteum can there be liberated. At certain areas corresponding to the origins and insertions of the muscles, the adhesion of periosteum to bone is especially intimate: here the fibers of the tendons, of the periosteum, and near the articulations, of the joint ligaments, are most closely blended, exceptionally strong, and protrude downwards among the osseous lamellae, for an extraordinary distance, thus affording a very effectual anchorage. This accounts for the fact that fairly often a powerful muscular contraction will tear away a thin shell from the cortex of a bone, causing what has recently been designated a sprain-fracture.

Under the microscope, one distinguishes two layers in the periosteum. The inner layer, more solidly built than the outer, is composed of connective tissue bundles, among which are numerous elastic fibers, these latter also being prolonged into the bone along with Sharpey's fibers. The outer periosteal layer carries a close network of blood-vessels which, with the lymph and nerve plexus, furnishes nourishment to the bone. It is very important that the integrity of the circulation between the periosteum and bone be maintained; otherwise the nutrition of the bone may become insufficient and more or less caries is likely to result. The so-called nutrient artery to the bone, furnishes nourishment chiefly to the bone marrow; its anastomoses with the periosteal circulation are not overabundant, and the current of blood in each is distinct.

The periosteum covering the bones of the skull is distinguishable by the fact that it is entirely devoid of elastic fibers. This probably accounts for the frequency with which lacerations of the scalp extend down through the periosteum without any fracture of the cranial bones. The absence of any elastic tissue precludes the possibility of sufficient "give" to the pressure of a blow, directed throughout a linear application, and a separation consequently occurs. In these cases, it very frequently happens that a part of the bone exposed in the bottom of the fissure, owing to the impoverishment of the circulation (mention of which has already been made), undergoes cellular death, and delays the healing of the wound until the resulting sequestrum is exfoliated.

Between the bone and the periosteum one can demonstrate microscopically a stratum of large polyhedral or irregularly shaped cells, supported in a loose connective tissue layer. These cells, the so-called osteoblasts, are the progenitors of the bone corpuscles, which are sheltered in the lacunae of the Haversian systems. The osteoblasts have for their

function the depositing of a calcareous intercellular substance, the essential constituent of osseous tissue. In their natural development as soon as the osteoblasts are transformed into bone corpuscles, this property becomes latent and can be reawakened only on special occasions, as in the repair of a fracture or the transplantation of a segment of bone. After a bone has reached its mature stage any new formation of bone is accomplished by the osteoblastic layer of the periosteum. Whenever, for one reason or another, the membrane is forcibly separated from the underlying bone, one of three conditions may prevail: first, all of the osteoblasts may cling to the periosteum; secondly, they may all adhere to the bone (and this is very rare); third, and this is the usual condition, most of the bone-forming cells cling to the periosteum, and a few remain

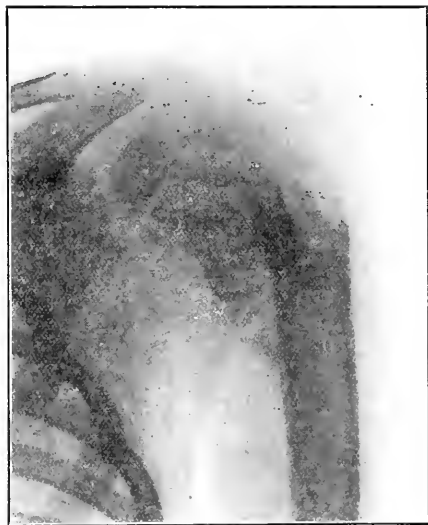


Fig. 1.

attached to the bone. All of these facts are of importance in explaining some of the traumatic and post-traumatic conditions of the periosteum.

CONTUSIONS OF THE PERIOSTEUM.

Contusions of this membrane are generally trifling in their extent, although they give, proportionately to their severity, an extraordinary amount of pain. They are most frequently met over the crest of the tibia. Sprains and contusions of the ligamentous structures of the joints are often accomplished by contusions of the periosteum.

HEMATOMA OF THE PERIOSTEUM.

This condition is one frequently met. The bleed-

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with an angulation of the shaft at the line of fracture. Here the callus formation is of moderate extent. The periosteum may be untorn with some of these fractures, and may be simply loosened from the shaft for a short distance from the line of fracture. A small cavity is thus formed which immediately fills with blood, and the healing here occurs, as it were, by "second intention." By this I mean that the osteoblastic cells, exposed on the periosteum, the surface of the bone, and on its cross section, fill up the space between and around the fragments exactly as granulation tissue fills up a wound in the soft parts. That applies also to the fractures with marked displacement. The periosteum may also be torn with fractures in this group, and the tear may be only on one side as in a greenstick fracture with angulation, or it may be torn all around, as in some of the fibular fractures and in some of the spiral fractures of the tibia. In some of the last group, the line of division of the periosteum may be at a different level from that in the bone, and the loose ends of the membrane may slip in between the fragments and delay the healing. The amount of callus is, as I have said, never very great.

I have frequently seen surgeons, while operating for fracture, define the periosteal flaps, and if these protruded between the fragments, cut them off flush with the ends. I believe that every bit of periosteum should be saved, however badly torn, and if, in order to obtain good apposition, it is found necessary to reset the ends, the section should be done subperiosteally.

The third group takes in all the fractures with much displacement, including those with marked separation in the axis of the bone and limb, those with marked angular and lateral displacement, and those with overriding; also many of the compound fractures, the gunshot fractures with comminution, and some of the sprain-fractures. They include especially, the fractures of the long bones of the arm and thigh, simultaneous fractures of both bones of the forearm and leg, and fractures in the neighborhood of the elbow and knee.

Whenever there is marked displacement, one never finds an intact periosteum. The tearing may correspond closely with the lines of fracture or, exactly reproducing them, it may be at a different level. The laceration may be circular or oblique, or it may follow the axis of the bone or limb. There may be more than one longitudinal tear, and if the periosteum is ripped away from the bone for a considerable distance, the membrane may hang in strips. The stripping up of the periosteum may be excessive, and may cause the baring of a consid-

erable part of the shaft of the bone, and thus impoverishing its blood supply, may lead to caries.

The laceration in the periosteum, whether longitudinal, oblique, or transverse, may not extend completely around its circumference. It may reach merely half or two-thirds of that distance, and leave a periosteal bridge which, forming a physical connection between the two fragments, will have a strong bearing in the healing of the fracture. There may be simply a rent in the periosteum, through which the ends of one or both fragments protrude more or less completely. When this condition is at its maximum, the healing will progress very slowly, there may be faulty or non-union, and an open operation will frequently be necessary. These fractures often show a marked degree of overriding. The amount of callus that forms, it goes without saying, is always excessive.

Probably the most frequent condition of the periosteum accompanying fracture, is one in which the periosteum is torn for only part of its circumference, leaving a bridge of membrane connecting the two fragments. The bridge itself may have an additional rent in it, or the fragments may be connected by several strips of periosteum at opposite points of the bone circumference.

If we take it for granted that the individual fracture has been treated with the best of skill, and reduction and immobilization have been carried out as nearly perfectly as human hands can, the effectiveness and rapidity of repair will depend to the largest extent on the condition of the periosteum. To be sure, the bone corpuscles exposed on the free section of the fracture, under the powerful stimulus of the reparative process, will call up their latent property of depositing osseous material but, as a rule, the total formation of callus from this source is very little, when compared with that formed by the periosteal osteoblastic layer.

The quickest and best healing is obtained when the fragments can be brought into good alignment and maintained in that position. Here the periosteum, however badly torn, is brought into closest relation with its appropriate segment of bone, the space between the fragments is practically nil, and the repair implies the least amount of work. When the fracture is complete, the callus, small in amount, will be uniformly disposed around the circumference of the bone; when the fracture is incomplete, the thickening will be still less, and limited to one aspect of the bone.

In those fractures with angular displacement, the convexity of the angle marks the area where the periosteum has been torn; the concavity, the area where a periosteal bridge is forming a physical con-

nection between the fragments. There is usually present on this side more or less stripping of the periosteum. When allowed to heal in this position, callus forms between the bared bone and the stripped-off periosteum on the concavity of the angulation between the fractured ends, and to a much less extent on the convexity of the deformity. The periosteal bridge ensures healing. If not corrected, deformity results, and if this be not excessive, a perfectly useful limb results. This variety is most apt to occur in the humerus and femur.

Figure 1 demonstrates the value of the protected bridge in the healing of a fracture with angular deformity. The periosteum, as he stood, starting unbroken between the fragments, on the concave side of the fracture. Callus has filled the space between the bared shaft and the bared periosteum, and has filled the gap between the fractured ends. There is practically no callus on the convexity, where the periosteum is completely bare. Although there is some deformity, the hand is a perfectly functioning arm. (Case No. 22, series of 1913.)

The periosteal injuries with fractures showing a lateral displacement are very similar to those with angular deformity. The periosteal connecting link may be single or multiple. However, just as frequently the periosteum is completely torn. If some part of the surfaces of the fractured ends are in contact, healing will be rapid, callus in moderate amount, and the final deformity very little. But if the lateral displacement is extreme, and the fragments are not in contact, repair will be slow, and the amount of callus and deformity excessive, or, in rare cases, there will be fibrous union or no union.

Fractures with separation in the area of the bone and limb are not usually slow in healing. This is accounted for by the fact that the joint team is completely severed, and the contact of the bone ends is completely lost. The friction between the fragments is not an indignant difficulty in healing the joint. The fracture is most common in the distal radius and ulna.

When one of the fragments is displaced somewhat, small, and consists of a thin cortical shell, corresponding to the insertion of a particular tendon, such as the tendon of the pectoralis, the condition has been called a "marginal fracture," and is almost unknown to clinicians. The prognosis with fractures of this kind, one considers, is all fortunate, when a strong and effective union is obtained. Even when a fresh fracture of this kind is treated by open operation, and the fragments are fastened together, the healing is almost sure only.

A middle-aged woman with a 10-year history of rheumatoid arthritis.

It is not clear whether the deformation in the large hole is due to the large extent of the shearing zone, or to the hole never intact, and the tearing of the material in the lines of longitudinal cracks. The deformation is very slow, the amount of longitudinal deformation marked by holes is small, and certainly it may re-



be given its due importance, in accounting for the frequent occurrence of necrosis of the fractured ends. The impoverishment of the blood supply, which occurs when the integrity of the periosteal circulation is disturbed, is amply sufficient to cause the death of the bone cells. This of course, is aided to a large extent by the addition from without of pyogenic organisms. I have seen this same necrosis occur in a simple fracture.

A young boy sustained a fracture of his radius. There was absolutely no wound of the skin. When the cast was removed, a sinus was disclosed, which lead to carious bone. There is no doubt in my mind that the shaft of the bone was denuded of its periosteum for a considerable distance. Case No. 1825, series of 1913.

INJURIES OF THE PERIOSTEUM WITH DISLOCATIONS.

Injuries of the periosteum accompanying dislocation are infrequent, and almost invariably they consist of a separation of the membrane from the underlying bone. As the head of the bone is forced through the joint capsule, it not infrequently strips away the periosteum from the bone, where the capsule blends with it, before the tear in the capsule itself is accomplished. When the dislocation is reduced the periosteum may return to its normal relation to the bone and, becoming agglutinated to it, may cause no trouble. Or, a formation of callus may take place between the bone and the periosteum, which, if it attain sufficient magnitude will be an insuperable obstacle to the proper performance of the joint movements.

A truck driver sustained a backward dislocation of both bones of the forearm. An enormous hematoma was present and the ligaments were badly torn. At the end of a month, motion in the elbow joint was much restricted, and an x-ray photograph (Fig. 3) demonstrated a large mass of callus on the outer and ventral aspect of the humerus, extending upwards from the margin of the capsular attachment, which prevented any flexion beyond a right angle. Case No. 438, series of 1912.

No referata are given for the references to these conditions are few, and are found as very short remarks in a few of the very many articles written on associated lesions. The standard text-books provide very little. Bardenheuer's book is an exception. The greater part of this paper is based upon my own observations in the clinic.

1200 MADISON AVENUE.

SURGICAL TECHNIQUE AND INFECTION.

The surgeon is no longer one who operates, no longer one who cuts vessels and ties them again; he is the one who can array the numerous factors that go to make recoveries, failures or deaths in such a way as to give the best results with the least risk. —W. A. BRYAN in *The Southern Practitioner*.

SOME PRACTICAL NOTES IN SURGICAL PHYSICAL DIAGNOSIS.*

ROLAND HAZEN, M.D.,

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PARIS, ILL.

ABDOMINAL PALPATION.

Skilful and intelligent palpation is of inestimable value in surgical work.

I am convinced that the physician often fails in his abdominal and vaginal examinations to secure as satisfactory results from palpation as he might if he were to insist upon better relaxation of the abdominal walls on the part of the patient. The first step in the routine palpation should be directed to the state of the abdominal muscles, and no sudden or painful manipulation should be made until, after coaching the patient in letting his muscles relax, one has secured his complete confidence and co-operation in procuring the best possible degree of flaccidity of the abdominal walls. Then, and not until then, may attention be directed to the condition of the internal organs, insisting at all times throughout the examination upon this relaxation. Oftentimes the findings, which are perfectly plain under these conditions, may otherwise be difficult or impossible to detect, as for example; the moderate grades of local rigidity of the abdominal walls, small or deep seated abdominal growths, enlarged gall-bladder, etc.; and in the bimanual vaginal examinations, the detection of the fundus of the uterus, the ovaries, the outlines of growths in the pelvis, their degree of mobility, etc.

It is common practice to have the patient flex the knees for abdominal examinations, but as a rule I find that this entails some muscular tension on the part of the patient, and that better relaxation can be had with the limbs flat on the bed or table.

KIDNEY PALPATION.

A floating kidney will sometimes fail to be detected by the usual examination in the dorsal position, but may be readily identified if the patient is turned over so as to lie on the side opposite to that of the examination, with the thighs slightly flexed, or if he is placed in the sitting posture with the body inclined forward and the elbows resting upon a table to secure abdominal relaxation. The explanation of this rests in the fact that at times the kidney is so placed in its bed that it must first be displaced inward and forward before it can descend.

COSTAL ARCH RIGIDITY.

The value of the information received through

* Read before the Aesculapian Society of the Wabash Valley, May 28, 1913.

chial breathing is to be heard normally. If the clavicle becomes fractured these breath sounds disappear from that side, and when bony union has been established they will again appear.

This test, where applicable, may well be used as a routine observation in the healing of fractures, as the sound conduction will return, if progressing satisfactorily, long before one would care to risk the manual test for false motion. In the case of the clavicle the beginning return of the breath sounds may be heard as early as two weeks, from which time on they usually increase to the normal at the fourth or fifth week.

JOINT PALPATION.

In the examination of surgical conditions of the joints it is of the utmost value in the symmetrical palpation of the bony relations, to keep the joint gently rocking back and forth, through passive flexion and extension, or rotation, as the case may be, throughout the examination.

WHAT ARE CONTRAINDICATIONS TO THE OPERATION FOR THE RADICAL CURE OF GASTRIC CANCER?

EDWARD A. ARONSON, M.D.,

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NEW YORK.

At the present day most lay people are cognizant of the utter futility of the medical treatment of malignancy; and when one considers the enormous prevalence of cancer and the appalling frequency with which the gastro-intestinal tract, particularly the stomach, is affected, we naturally conclude that some more decisive and helpful means must be employed to reduce the very large mortality.

Today we have but one such help more reliable than any other and that is surgery. When surgery is mentioned, however, I wish to emphasize the choice of the surgeon, because the operation for a radical cure is dependent upon good judgment and good technic.

It will indeed be utopian when the surgeon can be dispensed with and the cure left to the successful employment of sera or other chemical methods, but up to the present we have nothing short of surgery to attempt a radical cure. Having made a probable diagnosis of malignancy by the employment of all the diagnostic methods at our disposal, the patient must be persuaded to consent to immediate operation provided there are no contraindications.

Wm. Mayo says, "From my experience cancer, as cancer in the stomach, does not produce symptoms upon which an early diagnosis can be made. Only when its situation makes a palpable tumor mass or produces obstruction can a probable diagnosis be established."

We have at times seen patients who present almost every symptom with the exception of a palpable tumor, whom we morally feel have malignant disease and should be immediately explored. Such patients many of us persuade to be operated upon. There are always some colleagues who are extremely hard to convince and who absolutely refuse until they can palpate a mass, which by that time may be of considerable size and may have already formed metastases so that a radical cure is improbable. It is fortunate that the latter type of physician is diminishing in number owing to the assistance derived from the Roentgen ray examination.

When we consider the contraindications to an operation for the radical cure we find that there are but few, namely, a diagnosis made late in the disease; the presence of metastases or extension into neighboring organs; marked debility of the patient; the presence of some accompanying severe organic disease, *e. g.*, of the heart, arteries, kidneys or lungs; some marked constitutional disease, as diabetes mellitus.

Heretofore the finding of a tumor indicated an inoperable condition; this is a mistaken idea. The size of a tumor is less important than is the presence of adhesions. I daresay there are many surgeons who can recall some cases in whom at operation very extensive infiltration was found, the tumor mass and glands were excised and the patients continued to live for several years afterwards, apparently well.

It was my good fortune last winter to see in Vienna a patient from the Hochenegg clinic, seventy-two years of age, upon whom fourteen years previously a complete gastrectomy was performed for malignancy. It was indeed a pleasure to see the patient, the excised stomach and the radiographic pictures of the present esophageo-intestinal union.

One of the large bugbears in considering operation is the condition of the lymphatics. Mayo lays particular stress on this when he says that "the physiologic function of the lymphatics is a most important factor in relation to the radical cure of carcinoma. The stomach is generously supplied with lymphatics and gives the smallest percentage of radical cures. The pyloric segment has nine-tenths of all the lymphatics of the stomach."

Enlarged lymph nodes will be found in a high

percentage of cases but they are not always malignant. Mayo advocates that "when the disease in the stomach is mechanically removable and infected glands exist that are not removable, a resection should be done if the patient is in fair condition. It gives such patients generally some comfort for one to two years. Moderate involvement of the pancreas does not preclude operation."

The assertion recently made by some clinicians that the presence of lactic acid was a contraindication to the operation for a radical cure is in all probability going a little too far and it should be ignored. Experience has taught us otherwise.

The presence of a more or less continuous fever serves for some as a contraindication. The temperature curve may show marked irregularity, in other cases it may assume an intermittent character. The rise of temperature in malignancy may be due to toxic absorption or it may indicate the presence of complications.

From October 1, 1897, to October 1, 1912, the Mayos performed 1,498 operations for carcinoma of the gastro-intestinal tract, of which 996 involved the stomach. Of these 996 it was possible to do the radical operation in only 344, or 34.5%. Taking into consideration that the initial recoveries, according to Mayo, are in the vicinity of 90%, and that these patients are given a chance of permanent cure approximating 25%, it seems incumbent upon us all to make every effort toward an early diagnosis and immediate operation.

Well in a reference stated that at the Breshler surgical clinic, 157 resections were performed during the last five and one-half years, of which 135 were for carcinoma. Of the 101 who survived the operation and its sequelae, 46 are still living, in some of whom the operation was done more than five years previously.

The patient in whom a cancer of the stomach has been diagnosed, should not be treated with pessimism and skepticism as to the result from an operative interference, for one is commonly very agreeably disappointed. Every operation for cancer of the stomach always begins as an exploration, inasmuch as all gastric cancers present features of uncertainty until the abdomen is opened. Only then is it possible to decide whether the operation to be employed is for a palliative or curative purpose.

Every patient should be given a chance. A cancer of the stomach is recognized as a disease which, in the present state of our knowledge, is not remediable by early removal. Delay in establishing a diagnosis and delaying surgical intervention is

never a good thing, in relation to the operation to be performed.

DISCUSSION OF THE PROBLEM OF A PRIMARY DRESSING FOR SKIN GRAFTS AND IN THE TREATMENT OF BURNS AND GRAVE TATTOO WOUNDS

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The multiplicity of dressings for skin grafts tends to prove that, in reality, either immediate or remote, are not entirely satisfactory and leave much to be desired in comfort to the patient, in celerity of healing and, eventually, in the viability and pliability of the skin.

In this age of progress and surgery, the personal equation becomes a strong factor. The tyro does not hesitate to attempt the simplest operation of extensive skin grafting with the only too frequent result of merely increasing the patient's suffering by giving him an added and disabling wound of the thigh or of such other part of the body from which the graft was removed. Let us omit any mention of the mental and physical distress of the friend or relative who, so nobly and uselessly, plays the part of donor.

An ideal dressing for a fresh skin graft should satisfy certain requirements, such as:

1. Soiling of the graft to its new bed.
2. The initiation of infection or its rapid removal.
3. Stimulation of epithelial proliferation.
4. Comfort.

The more perfect the result of dressing, the satisfactory the graft, the more the patient is obedient to the treatment and the more the extent of its coverage is increased.

Rubber is a poor material of a waxy, and in extreme cases, of a sticky nature. Success is dependent on the cleanliness of the graft, and to a certain extent, on the cleanliness of the dressing itself. The ideal dressing, therefore, for a dressing to be as well indicated which is absolutely comfortable to the patient, to rubber there are no alternatives. The dressing, provided, the exception is made, should be that the newly implanted graft is held at a distance from the surface of the bed, thus insulating leaving few, if any, points of contact.

The pressure of the dressing for the graft tends to be increased by the contact with the underlying

surface, and is apt to be removed in toto at the first dressing. To overcome this defect the gauze has been applied damp and kept in this condition by constantly wetting with salt solution. This requires a great deal of attention, and if, perchance, the under surface does become dry, failure results. Moreover, too assiduous wetting causes maceration.

Granting the advantages of the open air method under ideal conditions, the objectionable features are many. Primarily, the grafts are apt to be disturbed during the restlessness of the patient while recovering from the anesthetic. Subsequently the exudations become dried and caked, covering the surface with an unsightly mass, beneath which increasing excretions are endeavoring to find avenues of escape.—a mass most difficult to remove, of offensive odor, and far from conducive to the comfort of the patient, whose well being we particularly desire. A carefully constructed screen must also be used to protect the wound from contamination by flies and dust.

Having experienced these disadvantages, and in the hope that I may offer a solution to some of them, I shall briefly review the ideal technic of skin grafting by the Thiersch method, and submit a dressing which has given such complete satisfaction over a period of more than two years that I now depend upon it entirely.

As it is essential, or at least most desirable, that the body forces should be at their best, we should not attempt to skin-graft a patient debilitated by long confinement in bed, necessitated by the original burn or injury. Suitable hygienic and dietetic measures should be employed until his physical condition is comparatively restored. During this time especial attention should be paid to the wounded area so that the granulations may become strong and healthy. On the night before operation the thighs are thoroughly cleansed and dressed with sterile towels. Under the anesthetic the wounded area and the thighs should again be cleansed with very hot salt solution. As it is most important that no anti-septic solution be brought in contact with the body of the patient, the hands of the operator or assistants, it is a wise precaution to have all such solutions removed from the room. The exuberant granulations are now removed with a dull curette or the surface freshened by vigorous rubbing with dry gauze until there is free bleeding. The area is then covered with a towel, wrung out of very hot salt solution. This is kept in place, to be removed only as the grafts are transferred from the thigh. These grafts should be so thin as to be translucent. The tendency to cut them too thick

may be partially obviated by using a regular heavy skin-graft razor, which is flat on the under surface and concave on the upper. By a quick, sawing motion the desired graft is removed, leaving an area dotted with pinpoint bleeding, which will heal promptly and does not incapacitate the leg. The grafts thus obtained are laid evenly upon the granulating surface, underlying blood and air bubbles being carefully removed, and then pressed firmly into place by means of a gauze sponge wrung out of hot salt solution. The dressing is then prepared and applied in the following manner:

Strips of gauze, six to eight layers in thickness, are thoroughly impregnated and *buttered* with sterile 33 1/3% bismuth paste (Beck's paste). These are laid directly over the newly implanted



Fig. 1. Appearance of grafts three weeks after operation.

grafts, smoothly and in order, extending for two or more inches beyond the area of the wound. No wrinkles or folds should be permitted to remain. Over these there is placed a layer of absorbent cotton, and the whole dressing held firmly in place by a roller bandage.

The first dressing should be done on the fifth day and at this time, especially, does success depend upon the skill and care exercised in the removal of the primary dressing. A similar dressing is re-applied and subsequent dressings done on every third or fourth day as the case requires. At about the fifth dressing one is able to peel from each graft a thin film of dead cuticle, leaving a firm, pink healthy graft in position, whose edges are already rapidly advancing to join those of its neighbors.

The advantages of this dressing may be best

appreciated by trial. In my opinion, it approaches more closely to the ideal than any other form. The grafts are held firmly in place; exudation becomes almost negligible; there is stimulation of the proliferation of the epithelium, not only from the edges but also from the deeper surface, that exceeds by far the effect produced by Scarlet R, and lastly the patient expresses a sense of comfort frequently absent in the other types. The resultant scar is soft and pliable, and shows no tendency to break down. The accompanying illustrations represent the first case on which I tried this method over two years ago. Although a very intractable boy, who made no attempt to forward efforts on his behalf, but who, on the contrary, retarded every endeavor directed toward his recovery, the results in his case



Fig. 1—Stanley, before treatment. Fig. 2—Stanley, after treatment and dressing improved.

were so eminently satisfactory, that I have clung to this procedure to the exclusion of all others.

The boy received his burn on November 9, 1910. While playing about a bonfire one of his playmates threw a can of gasoline over him and pushed him into the fire. He lay in the hospital a twisted life and death for seven months. The burn extended from his chin to below the umbilicus, involving two-thirds of the circumference of his body. He was being treated by an open air method and the stench was intolerable. When the piled up crusts were removed with olive oil, his screams disturbed the entire ward. My first efforts when I took charge of him were directed toward raising his bodily resistance and to get the wound in condition for grafting. On June 5, 1911, I did the first

excision, using as a dressing bismuth paste and wet gauze. At first all appeared favorable as the grafts had taken well, but gradually they "evaporated," leaving the wound as extensive as in the beginning.

It was during this interval that I began to use bismuth paste as the dressing for the granulating wound. Immediately the wound area changed for the better. The abundant exudation diminished rapidly, the granulations became more and healthier, and the surrounding edge began to heal. This may be observed in illustration No. 1, particularly at the lower border of the wound. I then decided to graft again, using bismuth paste as a primary dressing. The result was as I have previously described. Illustration No. 1 shows how the grafts appeared three weeks later. It may be observed that although the grafts were originally separated by an inch or more, in many places they have already fused, either with their neighbors or with some part of the surrounding border. Their healthy pink color and their thickness cannot be well appreciated from the picture. The second illustration shows the condition seven weeks later, after the contracting bands in the neck had been cut and his own foreskin had been implanted in the left angle.

The action of bismuth paste, when used in the treatment of this large granulating surface, was so noticeably beneficial that I have since used it as a routine measure in all granulating wounds. I use it as a primary dressing in burns, when it is not possible to follow Roysing's method, and always as a secondary dressing. Its action is mildly antiseptic and astringent and in cases where I have used it in conjunction with Scarlet R, on the same patient it exceeds the latter in the stimulation of the growth of epithelium.

55 East 61st Street

TO BE TAKEN INTO CONSIDERATION

The first and most important lesson which both physicians and laymen can learn is to open widely all wounds of the kind which I allude to, and get dirt from the surface out of the deeper part. We should not content ourselves with cleaning or disinfecting the surface around the wound, but should use the blunt, antiseptic instrument, the needle and good watertight syringe, to reach the bottom of the wound cavity and remove all of the foreign material.

—DR. J. F. FISHER, in *The Modern Medical Recorder*.

REPORT OF CASES ILLUSTRATING INTRACRANIAL COMPLICATIONS IN PURULENT MIDDLE EAR DISEASE.

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The great importance of these complications, and with the high mortality following them, is my reason for publishing the following case reports.

The intracranial complications of purulent middle ear disease are thrombosis of the sigmoid sinus, epidural abscess, suppurative labyrinthitis, meningitis, and cerebral or cerebellar abscess.

CASE I:—Miss A. M., 13 years of age, contracted influenza two weeks ago; four days ago her left ear became painful, a day later a bloody discharge from that ear appeared spontaneously, which became sero-purulent within a day. When I saw her for the first time on May 5, 1909, she suffered from a typical purulent otitis media of the left ear, the drum being perforated in the posterior lower quadrant and not bulging to any extent. No pain on pressure over antrum or mastoid tip. Temperature and pulse normal. At the same time she had symptoms of an acute rhinitis and pharyngitis, no sign of accessory sinus suppuration.

May 22nd, 1909. Ear is practically dry, perforation had not closed yet, pharynx still looked congested.

May 30th, I was called to her home where she gave the following history. For two days she had had headache, had vomited a few times, and felt somewhat drowsy. The discharge had reappeared to a slight extent; drum not bulging; upper posterior meatus not edematous. Mastoid bone painful on pressure. Pulse 108, temperature 103.5°.

She was transferred immediately to the German Hospital where I did a mastoidectomy at 1 A. M., May 31st. The operation disclosed an acute otitis, the bone bleeding very freely, but no pus.

The sinus was slightly exposed and looked normal. The temperature dropped immediately to 99.2° and rose within the next twelve hours to 105.6°. For the next five days the fever curve ranged between 101.5° and about 104°. The Widal reaction was negative. The differential blood count showed on June 5th, w. b. c., 18,700, poly 92%; small lympho., 8%. June 6th, w. b. c., 19,500, poly 88%, small lympho., 8%. June 7th, w. b. c., 18,800, poly 70%. Small lympho., 12%.

Spleen slightly enlarged. No chills, no sweats, no headache, no vomiting, no Babinski and slight Kernig reaction, no opisthotonos. Labyrinth functioning.

On the afternoon of June 7th I explored the wound by exposing the dura in the middle fossa, which looked absolutely normal and not bulging. I exposed the sinus from the region of the bulb upward for about one inch. It looked absolutely sound and felt normal, and after compression filled right up again. After the operation the tempera-

ture rose to 106°, and after ranged between 102° and a little above 104°, the pulse being a little more frequent. There were none of the classical signs of meningitis. On the afternoon of June 9th, she vomited some yellow matter, on the 10th she became slightly delirious and vomited a few times; on the 11th she became comatose with tetanoid motions. Lumbar puncture showed fluid under slight pressure, slightly turbid, containing pneumococci. Lumbar puncture was repeated the next day. On the 13th the patient died.

Autopsy:—Brain shows a fibro-purulent meningitis near the bone, some pus in the meshes of the pia, dura not very distended. Mastoid wound looks healthy. Sinus filled with a post-mortem clot. Frontal sinus contains a little muco-purulent secretion.

The question of the relationship of the meningitis to the acute ear infection remains unanswered, as there is the possibility that the meningitis might be simply an independent complication of the same infection. There is also the possibility that the infection might have come from the frontal sinus or the nose. In future in a questionable case, I shall make an early lumbar puncture for diagnostic and prognostic purposes.

CASE II:—B. M., 22 years of age, hatmaker, without inherited or acquired disease; suffered since early childhood from a discharge from the left ear, following as nearly as he can remember an attack of influenza. For six months he felt a fullness in the left half of his head, accompanied occasionally by pain and slight vertigo. He was treated for some time in a dispensary where he got only very slight and temporary relief.

On October 17th, he came to the dispensary of the Har Moriah Hospital. He had then a decided diminution of hearing in that ear. Conversational voice heard at six feet. The caloric test showed a reasonable functioning labyrinth. There was no nystagmus, except a slight spontaneous one, when looking toward the affected ear.

Examination of the left ear shows a large fibrous polyp filling the whole meatus, so as to prevent a more detailed examination of the middle ear; therefore, I removed the polypus with a small ring knife, bearing in mind that such polypi are often attached to the dura in the presence of a defect in the tegmen tympani. I did not use a snare as I should have had to pull rather forcefully on account of the firmness of the polypus. The removal of the growth was accompanied by copious bleeding, therefore I inserted a tampon of sterile gauze and examined him the next day after removing the blood clot under sterile conditions without washing. I found that the drum had disappeared with the exception of a part of the membrana flaccida. There was no trace of the ossicles, the rest of the polyp being attached somewhere in the attic. Patient felt very much relieved until the night of October 10th, when he felt chilly, vomited, and had an agonizing frontal headache. When he was brought to the hospital, he had a temperature of

pus rolled out from the epidural space. I then removed a piece of bone as large as a 25 cent piece from the squamous portion of the temporal bone, one shank of the bone forceps in the cranial cavity, the other in the mastoid process. After the removal of the tegmen tympani I saw in that location a gangrenous spot in the dura through which a few drops of pus followed. A knife pushed into the brain for about $3\frac{1}{2}$ cm. did not increase the flow of pus, but when a needle was pushed in the pus began to pulsate out. A flat draining forceps was inserted alongside the needle, the fistula dilated, and a rubber tube inserted for drainage. The pus contained bacilli proteus. The operation lasted $4\frac{1}{2}$ hours, the patient rallied well and for five days the temperature ranged between 100° and 101.5° , his aphasia persisted but headache disappeared. Blood count showed 36,000 w. b. c., 82% polys.

On the 6th day, when I changed the dressing it was apparent that he had a gravitation abscess in the neck. This was incised and drained. After that the polynuclears were 78%. The brain wound still discharged pus and macerated brain tissue. The patient gradually became more and more apathetic; a facial paralysis developed on the opposite side. In spite of repeated attempts I could not locate a secondary abscess, and on the 12th day the patient became comatose and died, with all the clinical symptoms of meningitis. Unfortunately I did not succeed in getting permission for a post-mortem examination.

At the time I saw the patient in October, when he complained of headache and slight dizziness, he was in all probability suffering from an epidural abscess.

On December 4th, when he had the chill and sudden pain the pia mater became involved and became adherent to the dura and the pus broke into the brain. In other words he then had meningeal symptoms of the initial stage of brain abscess. The secondary stage lasted only a few days, when the third stage with posture symptoms made its appearance. The high blood current and the temperature showed that there was a co-existing meningitis, which made the prognosis in this case very unfavorable from the beginning.

CASE IV:—M. R., 43 years of age, seen in my office November 10th, 1910, gives the following history: About two weeks before he had pain in his left ear, which had previously been opened somewhere else. Ever since his ear feels full and he cannot hear the ticking of the watch and whispering. The drum looks purplish and thickened and is retracted. Catheterization gave him immediate relief and improved his hearing.

December 7th, the same condition still persists; treatment gives but very temporary relief.

December 13th, he returns stating that after some pain in the ears he noticed a slight discharge which comes from a small perforation in the anterior lower quadrant.

December 18th, ear is dry.

December 28th, he returns complaining of severe pain in the ear which has persisted now for three days. Temperature 100.4° . Drum swollen and

edematous. Enlargement of the paracentesis opening.

December 29th, temperature 103° after a slight chill, unbearable headache; pain on pressure over mastoid. He is transferred to the German Hospital for examination. Temperature rises during the night to 105.4° . Differential blood count shows 18,000 w. b. c. and 82 polys.

December 30th, mastoid inspection discloses very little at fault in the mastoid process, sinus is explored and found normal. Dura is explored and found normal. Nothing found to explain the high temperature.

December 31st, after operation temperature falls to 100.2° and rises in the evening to 101.2° ; some vomiting, pulse only 72 and slightly irregular.

January 1st, patient still vomits, temperature practically normal. After that he feels better, complaints still of some headache.

After five days wound is dressed and seemed to be in good condition. He leaves the hospital on January 2nd, to be treated at home.

January 18th, while in my office, he points to a glass and asks for a drink of water; he cannot name the glass. There is still some discharge of pus from the aditus and antrum. He is put to bed and watched for a few days, during which time the aphasia disappears. Wound still shows a discharge from the aditus.

February 13th, he has a recurrence of his aphasia with a decided headache.

Examination at that time shows:

Amnesia aphasia: words are heard and understood. Words are seen and understood. He does not write well at dictation, but copies properly. Reading is poor. He shows therefore amnesia-aphasia, some degree of agraphia, some degree of alexia.

Diagnosis of abscess of temporo-sphenoidal lobe was made and as the symptoms seemed to depend on the amount of pus draining through the aditus, and that amount being too great at times to come only from the tympanum, I made the diagnosis of a temporo-sphenoidal abscess draining through the tegmen tympani.

February 14th, patient returned to the hospital where a blood count showed only 9,600 leucocytes, 78% polys.

February 15th, operation. Old wound curetted, tympanum exposed according to the Schwartz-Stacke, tegmen tympani curetted away, showing a fistula leading into the brain through which about one ounce of foul pus oozed out; broad bladed forceps inserted and fistula dilated. The former median incision is now extended curving around the upper insertion of the auricle, a piece of bone is now chiseled out of the squamous portion of the temporal bone, the exposed dura is incised by a cross incision and the brain incised until the knife meets the probe in the abscess cavity, which has been entered from the tympanal side. An iodoform gauze drainage inserted.

The patient's condition for the next two days was fair, then his temperature went up to about 104° ; blood count 20,000, 90% poly. Lumbar

MILITARY SURGERY.

GUSTAVUS M. BLECH,
CHICAGO.

GUNSHOT WOUNDS OF THE CHEST.

Of greatest practical interest to us appears the region of the chest, not so much because it contains organs of vital importance—lungs, heart, large blood vessel, mediastinum, esophagus—but for the fact that, aside from the immediately fatal injuries, wounds logically should place the recipient hors de combat, produce no important symptoms, at least not at once, so that the patient labors under an illusion of a slight injury, while in reality he is but entering the road of serious disease if not of permanent invalidism.

For this reason it is imperative that each surgeon, including those in civil life, should be thoroughly familiar with the immediate and remote effects of wounds of pleura, lung and esophagus, and know what can and should be done to achieve the best possible therapeutic results.

The *soft parts* of the chest, when injured without involvement of deeper structures, irrespective of what kind of missile produced, require no other treatment than that which has been prescribed for soft parts elsewhere, for these wounds do not especially differ from like injuries elsewhere, the control of hemorrhage and the prevention of infection by the application of a regulation dressing is all that is required.

Hemorrhage of the intercostal vessels, though it is difficult to conceive an injury of these vessels without involvement of one or more ribs if not the lung itself, requires more energetic treatment. At the frontal aid stations, when time is pressing and dressing material limited, simple firm tamponade will be all that can be done. But whenever possible—and this is very often to be the case at the dressing stations proper—tamponade after the method of Langenbeck still remains the most efficient means of controlling this troublesome form of hemorrhage.

This method, briefly, is as follows:

A square piece of gauze is pushed into the wound by means of an artery or dressing forceps. If the pleura has been opened by the bullet the dressing should be pushed about half an inch beyond the pleura in the direction of the lung. The front part of the gauze dressing is kept open—spread out—and a few strips of gauze (the ordinary sterile bandages found in military outfits will prove admirable for this purpose) are forced into the gauze pouch. Taking a hold now of the pouch and gently but firmly pulling it outward, pressure is obtained

from within outward, somewhat on the same principle as when we attempt to arrest post-nasal hemorrhage by forcing a tampon into the posterior nare by traction on the tampon placed in the pharynx by means of a tied string that has been led out through the exterior nare. And just as we often compress the nasal passage also anteriorly counter pressure from without can be produced against the intercostal space either by folding the free ends of the gauze dressings and fastening over it other dressings or a piece of cotton, or, better still, by tying these ends over a piece of gauze.

The same treatment is applicable for hemorrhage of the internal mammary artery.

The *ribs* can experience in modern warfare the entire gamut of injuries described in the general part, from mere contusion to great loss of substance. While a rib may be fractured without necessarily involving the lung proper or even the pleura—a missile may strike the rib at its utmost lateral portion and thus only “graze” the pleura—usually pleura and lung will be involved, and the extent of this involvement will depend on the missile. It requires no great stretch of imagination to realize that the comparatively small wound of the infantry bullet will not produce the serious effects that will be observed in shrapnel or shell-splinter wounds. While in the latter, pneumothorax and collapse of the lung are inevitable, the former may not have enough immediate effect on the wounded man to cause him to seek medical aid.

For the present it will suffice to point out that fractured ribs must be treated in the field the same as in civil life—by immobilization through circular bandaging, adhesive strips, etc. When bandages or adhesive strips happen to be absent recourse must be had to improvisation. The belt of the injured soldier will prove an excellent substitute, at least until such a time as technically better dressings can be used.

The *lungs*, when pierced by small-caliber jacketed missiles, as a rule prove benign and early recovery can be anticipated. The same holds good also for the *bronchi*. Of course, vessels may be injured and produce a hemothorax.

Other missiles produce serious results. Many deaths on the battlefield are due to injuries by shrapnel, and the opening of the bronchi by missiles of large caliber almost invariably is followed by emphysema, which in turn may produce death by asphyxia.

A hemothorax may become absorbed, as can a pneumothorax, again infection may result and then we can observe the typical pictures of empyema, abscess and gangrene of the lung. It has happened

that such an infection has produced fatal secondary hemorrhages. Undoubtedly in such cases the pulmonary vessels have been primarily injured but not enough to cause serious results. Total solution of continuity by an infection will, therefore, kill where the vessels partially escaped the original trauma.

Patients suffering from wounds of the lung with *prolapse of lung tissue*, should be dressed only after the prolapsed portion of the lung has been fixed to the external wound orifice (skin) by a few sutures (silk).

Injuries of the *esophagus* can be diagnosed at the front only with a degree of probability. Nor is it of great importance that such a diagnosis be made, if this rule be observed: *In which there is even the least suspicion that the esophagus may have been involved not a particle of food nor a drop of water should be given by mouth.* It is only by following this rule that many a life will be saved while the non-observance of such a precaution may lead to death. Morphine. Dressing.

Injuries of the *heart*, if not immediately fatal, require rest and morphine at the front.

The above brief remarks apply, of course, merely to stations in front of the field hospital. Whether the patient be treated at the aid station or the dressing station, the treatment on the whole remains the same.

Tracheotomy for a threatening asphyxia due to emphysema may have to be performed at either of these stations. This will become imperative if some time has elapsed since receipt of the wound and the field hospital is situated at some distance. If the patient is found soon after injury the latter circumstance will not interfere with transportation, for it takes some time for the emphysema to assume a dangerous aspect.

As regard injuries of the heart rest and morphine are our mainstays. But suture of the heart should be undertaken.

This, however, is a formidable operation, and should be undertaken only by surgeons of great manual dexterity, though it cannot be said that the technic of the operation is especially difficult. The argument to show that medical officers are a poor thing, regiments or attached to ambulance companies, should be well trained surgeons.

We may now proceed to glance at the therapeutic opportunities at the *field hospital*.

Gunshot wounds of the lung, find here an opportunity for rest and morphine. If a few small effusions do not become resorbed, and produce oppression symptoms—aspiration is our remedy par excellence.

Aspiration of gas in the chest is observed. Never aspirate the gas—*insert the needle in the lower part of the chest, in the intercostal space, as late as possible, aspirate more than 100 c.c. of the effused fluid.* In either the syringe or the clinical phenol test, if we have to deal with an empyema resorption of pus is indicated. This can be performed under local anesthesia.

To be continued.

THE LIVES OF A NATION. STAFF OF THE 1918-1919. BY J. CL. SURG. 1938.

There is no doubt that by whatever agency the limitless growing tendency of malignant tumors may be due, the cells are malignant as is evidenced in their every essential with change in the parallel of which an only base is the embryonal life. The "spark of life," highest at the conception of the fecundated ovum, as is shown in the great mitosis, gradually wanes as life progresses. When we therefore meet with malignant growths, here is again a rejuvenation of cell energy—a renewed *vis a tergo*, which is confined not to all the tissues, but to individual types and subtypes of specific genera of tissues. It is known that the spermatozoon is markedly attracted to the ovum (chemotaxis). Since this is a fact it is not possible that another spermatozoon, under certain favorable conditions may enter and cause fecundation of a part of an already impregnated ovum; and, depending upon the time of the life of the impregnated ovum, inversely as the cells are differentiated, when certain forms of monstrosities are produced; and, extending down into the time when the cells are completely differentiated, when we may have simply differentiated completely differentiated cells, or the beginning of so-called malignant growths. Such a process might be possible at any phase of life, from earliest embryonal to post-fetal existence. Such fecundation may remain dormant, and grow at a later date. (See M. C. THORNER in *The Journal of Medical Research*).

ANESTHESIA IN THE FIELD SURGERY.

The dangers of field surgery relating to anesthesia, infection, hemorrhage and shock have been related to a party with those connected with any other form of surgical operation. Discussions concerning anesthesia reveal the fact that in the great general lines of the country and Europe the mortality rate is about the same whether the anesthesia be local or general. There are dangers incident to any major surgical procedure and not peculiar to thyroid surgery. J. M. BARNHARTER in the *New Orleans Medical and Surgical Journal*.

Surgical Sociology

FIRST AID IN THE INDUSTRIAL FIELD.*

MAJOR CHARLES LYNCH, U. S. A.,
In Charge First Aid Department, Red Cross.
WASHINGTON, D. C.

While all in attendance at this meeting are doubtless well aware of the present death and disability rates from accident in this country, in the interest of full discussion of the subject which is assigned to me it will perhaps be desirable to say a few words on this matter. A brief statement of the American National Red Cross First Aid Department will therefore be quoted:

Accidents are constantly assuming more importance in the life of our nation. In the registration area of the United States comprising 58.3 per cent. of the total population, the statistics of the Census Bureau for the year 1910 (those last published) show, exclusive of suicide, 48,606 deaths from violence. These 48,606 deaths made a death rate of 90.3 per 100,000 estimated population for 1910, as compared with 43.627, or a rate of 85.8 in 1909. Since 1880 in the registration area in the United States deaths from accidents have increased 47.7 per cent., while in the same period deaths from tuberculosis have decreased 48 per cent. A very conservative estimate of the non-fatal accidents which resulted in incapacity for work in the United States each year is 500,000. And at least 2,000,000 accidents which cause temporary disability occur yearly. These figures, large as they are, do not begin to represent the percentage of accidents in some of the industries of the United States. For example, among railroad employees and miners, between 20 and 30 years of age, more than 60 per cent. of all deaths are due to accidents.

Deaths from accidents differ, too, from those which occur from disease. Accidental deaths are largely among the very best of our population. The suddenness and unexpectedness of such deaths and of injuries are peculiarly horrifying. Not only does the injured person suffer greatly in accidents, but in case of permanent disability or death, his family deprived of the support of the breadwinner continues to suffer. Thousands of such families become a charge on public and private charity yearly.

Reckoning the wage earning capacity of the average person killed or incapacitated by accident yearly at but \$500.00, we have an economic loss of \$250,000,000.00 per year. To this should be added the millions paid out in damage suits and legal expenses, as well as the expense involved in the surgical care of injured. The loss involved to those who are not perma-

nently separated from their work and are put to additional expense through accident should also be added in calculating the cost of accidents.

The condition being as represented, it is rather remarkable that greater efforts have not been made to correct it. Typhoid fever as a cause of death does not compare with accidents in importance, yet the work done to prevent typhoid has been many times greater than that expended to prevent accidents and the bad results of accidents.

It rather seems as though we must have assumed a wrong attitude on this question. Have we not been in the same position as the ignorant in respect to disease? That is to say, have we not ascribed too much to act of God in relation to accidents and the results of accidents? These in great measure go hand in hand, as will be explained later. Certainly physicians have not taken the lead here as they have in the prevention of disease, yet there is plenty of room for services which they alone can render.

All honor is due to those who have made our industries less dangerous through the installation of safety appliances. Last summer in Germany I was filled with admiration at the Museum of Sanitation and Safety in Charlottenburg. We have our own museum in this city, which is well worthy of a visit, and many of the large corporations have outfitted their plants with safety apparatus in a manner that could not be excelled anywhere. It might be well to mention, however, that the German museum is a government institution, and the apparatus exhibited there is made up of models to which all must conform. This would appear to be a much better plan than ours, by which the installation of safety appliances is voluntary. Certainly the State should be empowered to make regulations which will insure maximum safety to its industrial workers. This is a measure of self-protection, if nothing else. Our country cannot afford to lose its vigorous manhood at the rate that they are being lost in certain of our industries at present. Not that it is claimed that safety appliances will prevent all this loss, for, as will be stated at once, this is not the case. But, on the other hand, their importance must not be overlooked.

Now, just what are the facts in respect to the importance of safety appliances? One of the most competent observers connected with a company which operates mills and mines on an enormous scale, and which, moreover, has been among the foremost in installing safety appliances, says not more than 30 per cent. of accidents can be prevented by such appliances. No one, so far as I know,

*Read by title at the 22d Annual Meeting of the New York and New England Association of Railway Surgeons.

where stops are made. As a matter of fact, we are able to meet the demands for many such lectures. Our practice on the railroads is to arrange an itinerary and send out advance notices. Stops are made at the more important points where the maximum number of men can be gathered together. The number differs, from one very important cause: Some roads give their employees the time to attend the lectures, and others require that the men stand the necessary expense themselves. The former method is, of course, much better in respect to efficiency. This work, if it is worth doing at all, is worth doing well, and the small cost of giving time to employees should, it is believed, be a just charge against the company concerned. In view of the fact that in certain mining districts we have been able to reduce disbursements of benefit associations one-half through first aid instruction, it is apparent that the company should receive more than the value of this small expenditure in increased efficiency.

We have really covered practically the entire country by our cars, except New England. Of course, we do not anticipate that we are going to teach any one all the first aid one needs to know in our railroad course. It will be necessary for the surgeons of the roads to carry on this work if notable success is to be attained. For example, on the D., L. & W., Dr. Wainwright has a splendid system for first aid instruction.

In a little over three years our doctors have traveled some 150,000 miles and have given more or less instruction to about 250,000 people. It has been said that "a little knowledge is a dangerous thing," and no doubt this is true. I am sure that any first aid courses should begin with the statement that it is just as necessary to know what *not* to do as what to do, but I am equally sure that if one demonstrates the treatment of the commonest injuries to railroad men or to anybody else, that if they encounter such injuries themselves much better care will be given than if no instruction had been afforded. Besides the work of our own physicians, backed up, as I have stated, by numerous doctors throughout the country, we are affiliated with the Y. M. C. A., the Y. W. C. A., the Boy Scouts, the Bureau of Mines, and the First Aid Society of New York City. Through these agencies we manage to reach a good many thousand people every year. With the Y. M. C. A. and Y. W. C. A. and the Boy Scouts we act as first aid representative. With the two former we issue a joint certificate. With the Bureau of Mines we are not doing as much work as was formerly the case. A satisfactory method could easily be worked out, but it

would be very expensive if all the mines were to be reached, and this is the reason why more has not been done. Of course, this does not mean that we do not reach many mines every year, for this is not the case. I think first aid is more appreciated in the mining regions than anywhere else, and we try to give as much attention as possible to miners. In the First Aid Society of New York we have members on the Board of Directors, and have conducted a campaign there recently to try to teach first aid in the industries of New York. This, I regret to say, has not met with notable success, and has been abandoned for the present. This raises rather an interesting question in regard to emergency treatment in cities. While I do not believe that first aid can be very satisfactorily taught in many industrial establishments in a city, I think that we are still very lacking in the proper organization for emergency care of ill and injured in all large municipalities. The small first aid stations which I saw in Berlin this summer impressed me very favorably. Of course, there the matter of their support is very easily provided for through the workmen's insurance. In Berlin in case of injury the person immediately goes to one of these stations and has his wound properly dressed; then, if necessary, he can return to the station for redressing. Now, what happens in most of our large stations? If a person is so seriously injured that it is necessary to take him to the hospital, he of course receives good care; but, on the contrary, if his injury is comparatively slight, he probably receives no care at all until later the seriousness of his condition may bring him to the hospital. If we are going to prevent deaths from accident, it seems to me essential that we should take the facts which have just been recited into careful account.

In the course of our first aid work we have found it necessary to organize a supply department. This started with some simple first aid books which I wrote and in some of which I collaborated with Dr. Shields. One of these books, by the way, has been translated into Slovak, Polish, Lithuanian, Italian, Portuguese, Spanish and Chinese, which would rather indicate that there is still some demand for first aid literature, notwithstanding the cheerfulness with which many physicians absolutely without experience in first aid have written books on this subject. Later we found it essential to supply certain teaching material, such as charts, bandages, splints, etc., for practice, and still later we went into first aid supplies. We did not do this without some hesitation, but it seemed absolutely essential to the efficiency of the First Aid Department. If one goes to a manufacturing concern and

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WALTER M. BRICKNER, M.D., Editor

NEW YORK, FEBRUARY, 1914.

GWATHMEY'S OIL-ETHER RECTAL ANESTHESIA.

The administration of ether vapor by rectum, for surgical narcosis, which at one time was thoroughly studied, never acquired general recognition and has, indeed, fallen quite into disuse. This was largely because of the severe proctitis that so often resulted. To obviate this and retain the advantages of anesthesia by this route, Gwathmey (*N. Y. Medical Journal*, December 6, 1913), has devised a simple method by which he introduces into the rectum liquid ether in which is mixed (dissolved) a quantity of olive oil varying inversely with the patient's age. The dose is regulated according to the age and weight of the patient. In children below six years of age a 50% solution is employed. It is increased in strength in older patients, and above the age of 15 years a 75% mixture is employed. As a general rule, about one ounce of the mixture is given for every 20 pounds of weight. The preparation of the patient is the same as for any operation, emphasis being laid upon thorough cleansing of the rectum. The mixture is poured into the rectum very slowly; through a catheter and funnel; about five minutes is consumed in pouring in eight ounces, the amount usually required. Anesthesia begins in about five to twenty minutes. If cyanosis or embarrassed respiration ensues, which are signs of an overdose, it is merely necessary to evacuate some or all of the mixture. After the operation, the rectum is washed out and some olive oil is poured in.

Gwathmey presents the advantages of this method as follow:

1. The element of apprehension and fear caused by placing a mask over the face in inhalation anesthesia is avoided.
2. No expensive apparatus is required.
3. The after-effects of the anesthetic are reduced to a minimum.
4. A more complete relaxation is secured than with any other known method of administration.
5. The limits of safety are widely extended, compared with other methods.
6. A more even plane of surgical anesthesia is automatically maintained than is possible by any inhalation method—unless administered by a skilled anesthetist using a perfected apparatus.

He refers to no disadvantages. His report was based on a series of 100 cases. In all of these the method was entirely successful, and there was no evil result. There was one death, that of an old man, twenty-four hours after the operation, probably not due to the narcosis.

This appears to be a satisfactory initial record of a procedure of such tempting simplicity that it would make unnecessary the services of an expert anesthetist.

We often find in medicine, however, that innovations which appear quite satisfactory to their introducers, and, at first, to others, develop defects on fuller observation. Gwathmey himself presents his report modestly and with the conservative observation that further trial is necessary. If a few hundred or thousand cases show that the procedure is as free from danger as it is simple, it will be one of the most valuable contributions to the science and art of anesthesia that has been made in many years. —W. M. B.

"BICHLORIDE" AND CARBOLIC POISONING.

In the past few months there has been a widespread "epidemic" of cases of fatal poisoning by the swallowing of bichloride of mercury tablets. The earlier cases were, and many of the others are reported to have been, accidental. There can be little doubt, however, that most of the instances recently recorded were of suicidal origin, this poison being selected both because of the relatively pleasant form of demise the newspapers have recorded for it and because the familiar headache-tablet-mistake could be readily invoked to conceal the victim's intent.

A very proper popular demand is making for the prevention of these accidents and legislation

has been suggested to provide, 1st, that all bichloride tablets, and the containers in which they are sold, shall be of distinctive color and shape; 2nd, that they shall not be dispensed without a physician's prescription. To these excellent provisions we would add, 3rd, *physicians ought not to prescribe them.*

Surgeons and obstetricians can, and many of them do, employ all of the antiseptic preparation for major or minor operations and dressings, without ever employing bichloride or mercury. What necessity, therefore, can call for its use in the household? It has been a fairly common practice to sublimate tablets for douches. Has bichloride of mercury any advantages for such a purpose, over less toxic antiseptics? And if it has, are they not outweighed by the danger of mercurial vaginitis or more general poisoning, instances of which are not at all uncommon? For the disinfection of a wound the official or a weak tincture of iodine is far superior to bichloride of mercury, while for general wound cleansing and dressing hydrogen peroxide, boracic acid solution, and the mild, also innocuous, antiseptic mixtures familiar to every household as throat gargles, answer every first-aid requirement.

What we have said of bichloride of mercury applies even more strongly to carbolic acid to the extent that, even when handled deliberately, spilling this liquid may cause a serious burn. Moreover, the employment of even a one per cent. carbolic acid solution in an impervious wet dressing on the fingers or toes usually leads to gangrene. This is well known to the profession, but it has not been sufficiently taught to the people at large and many a digit has been sacrificed to their ignorance.

The blame for cases of poisoning by these so-called antiseptics rests largely, we think, on the medical and nursing professions. They have been careless in ordering the drugs, too indignant in pointing their dangers, too careless of poisoning themselves, the household, after their proper surgical equipment has been disarranged.

Neither bichloride, formalin, carbolic acid, lysol or any other strong antiseptic should be used ever in any proper place in the household.

W. M. B.

The gall bladder is a very important organ, and its removal is a very serious operation. The body of the gall bladder is the part of the organ that is removed. The body of the gall bladder is the part of the organ that is removed. The body of the gall bladder is the part of the organ that is removed.

Surgical Suggestions

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RECENT ADVANCES IN SURGERY

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Surgical Sociology

Ira S. Wile, M. D., Department Editor.

THE STANDARDIZATION OF HOSPITAL EXPENDITURES.

In the administration of hospitals, the budget occupies an important place. The amount of money available largely determines the character of the services to be rendered by the hospital and the limitations of resources test the executive and administrative capacity of the hospital superintendent. Dr. Howell, Superintendent of the New York Hospital (*Journal of the American Medical Association*, November 20, 1913), discusses many of the factors influencing hospital costs and endeavors to answer the following question:

"Why is it that, while hospitals are slowly but surely establishing certain standards of excellence and are attaching to these standards certain specific uses and pretty well defined prices as to cost, and in this way are approaching uniformity in the cost of institutional maintenance, there is such a wide difference in the per diem cost as there is at present—one dollar per day in some hospitals and three dollars and more in others?"

Considering the fact that municipal hospitals and many of those under private control have per diem per patient expenditures of from \$1.25 to \$2, while private hospitals make similar expenditures of \$2 to \$3 a day, one is ready to ask, is the service of the more expensively run institution better or more efficient than that of which the per capita cost is at the lower rate?

The term, standard, is difficult to define. The standard of hospital administration depends upon the city in which it is located, the neighborhood which it serves, and the endowment which is available for its administration. It is proper that the best organized and administered institution should set the standard of hospital efficiency for the weaker institutions. On the other hand, it may be impossible for institutions doing similarly effective work to be run with the same per capita cost, owing to the differences in the costs of food and labor and the system of internal organization.

The variations in salaries, and the differences in hospital construction create large distinctions in the per capita cost. Obviously, the maintenance of pathological laboratories, ambulance departments, or social service will alter the per diem money expended per patient so that it becomes impossible to compare hospital costs except of institutions with similar organizations. The mere fact of the affiliation of a hospital with a medical school increases the cost of a patient's maintenance, inasmuch as there is an additional expenditure for various examinations, not necessarily required in general hospitals not connected with medical schools.

The number of nurses and orderlies employed, the character of the cooks, the number of waitresses, the number of hospital diets which are main-

tained also figure largely in determining the costs of giving efficient hospital care to the patients. Similarly, wide variations arise from the character of the patients served. Hospitals largely given over to surgical services are far more expensive than those maintaining large medical services, but with few beds devoted to surgery, gynecology, or obstetrics. Wherefore, in determining hospital costs, it is again essential to compare hospitals having similar services and then the per capita costs should be established for each department rather than as a single figure for all the patients.

When hospital service is urgent and convalescent care is given not in the hospital, but in the home, the number of patients who may be cared for annually is increased, and while the efficiency of the service may be lessened, the number of patients given emergency care is increased. Hospitals maintaining a large private room service have their costs increased disproportionately to their efficiency. In determining units of costs, it therefore becomes necessary to segregate the expenditures for private patients from those devoted to the care of ward patients.

The value of studies of per capita costs has not been thoroughly appreciated. Inasmuch as hospital trustees are responsible for the proper administration of trust funds, there should be a most careful scrutiny of the expenditures for all phases of hospital organization. There is no definite standard unit cost for the maintenance of a pathological laboratory for a hospital of a hundred beds, nor for the maintenance of a laundry for such an institution. It is possible, however, to thoroughly analyze expenditures so that trustees may appreciate where in economies may be made with a view to increasing the working efficiency of the hospital without increasing the budget.

In the Massachusetts General Hospital, a study has shown that the per capita cost of providing food for the internes is far higher than for serving the nurses or the patients. Obviously, this is more than a mere matter of interest, but it provides a problem of dietetic studies based upon the per capita costs and the nature of the food served. Similar studies of hospital expenditures in all departments, janitorial, nursing, clerical, pharmaceutical, surgical, kitchen, laundry, laboratory, ward, private room, operating rooms, ambulance, foods, plumbing, heating, lighting and repairs would give a vast amount of information relating to the general management of hospital departments. Unit costs of hospital architecture have been given some study, but the relation of hospital construction to the internal costs of administration have not been thoroughly reported by those who have made such studies for the benefit of communities whose hospitals are to be built in the future.

The science of accounting and the studies of efficiency have not been generally applied to hospital and dispensary services. Despite the fact that standardization is not possible in the light of our present knowledge, it is practicable for individual hospitals to approximately standardize their own unit costs so that the annual budget will be based

The Principles and Practice of Medical Hydrology.

Being the Science of Treatment by Waters and Baths. By R. FORTESCUE FOX, M.D. (Lond.); F.R. MET. SOC. Octavo; 295 pages. London: UNIVERSITY OF LONDON PRESS; HODDER & STOUGHTON and HENRY FROWDE, 1913.

This book takes up in a systematic manner the chief facts connected with the use of water in the therapy of disease. The first section deals with the physiology of bathing and the use of baths in health. The second deals with the principles involved in the use of water in disease; the third describes the various mineral springs, while the final portion reviews briefly the indications which call for the use of the various hydro-therapeutic procedures. The book is especially useful to patients taking cures in England, as particular attention is paid to the British spas.

Case Histories in Pediatrics. A Collection of Histories of Actual Patients Selected to Illustrate the Diagnosis, Prognosis and Treatment of the Diseases of Infancy and Childhood, with an Introductory Section on the Normal Development and Physical Examination of Infants and Children. By JOHN LOVETT MORSE, A.M., M.D., Associate Professor of Pediatrics, Harvard Medical School; Associate Visiting Physician at the Infants' Hospital and at the Children's Hospital, Boston. Second edition. Octavo; 639 pages. Boston: W. M. LEONARD, 1913. Price \$5.50.

The appearance of a new edition of Morse's book after so short a period of time is a recommendation in itself; but this second edition is so much more complete and so superior to the older one that it is in reality a new book. The number of case histories has been doubled, and there has been added a section of fifty pages on the normal development and physical examination of children. This portion of the new book should prove of the greatest value to the student, since in it he will find facts and figures relative to the child's growth and development, set forth in so terse and clear a manner that they must needs be very easily found and remembered.

The illustrations, which in the first edition were few in number and poorly executed, are now a very distinct addition to the usefulness of the book, being well reproduced on glazed paper.

The case histories are reported in a clear and interesting style, which makes their reading entertaining as well as instructive. For the student a careful consideration of the history and physical examination of each case, before he attempts to solve the diagnosis, must necessarily acquaint him with the commonest signs and symptoms of children's diseases. For the practitioner, however, the paragraphs on diagnosis, and especially those on prognosis, are very helpful, especially when it is remembered that these are all actual cases whose outcome is faithfully recorded.

Altogether, this new edition may be most highly recommended as an interesting and highly useful text-book of pediatrics.

Malaria. Etiology, Pathology, Diagnosis, Prophylaxis and Treatment. By GRAHAM E. HENSON, M.D., Member, American Medical Association, Florida Medical Association, American Society of Tropical Medicine, Medical Reserve Corps, United States Army (non-active list). With an introduction by CHARLES E. BASS, M.D., Professor of Experimental Medicine, Medical Department Tulane University, New Orleans. Octavo; 190 pages; 27 illustrations. St. Louis: C. V. MOSBY COMPANY, 1913.

This small book, like his other contributions to the subject, indicates Henson's first-hand clinical and hematological studies of malaria. It is a first-rate presentation of the most important phases of the subject. The occasional appearance of malaria as a complication of surgical illnesses, and the occasional confusion of malarial seizures with acute abdominal disorders, make it important for surgeons to be familiar with these manifestations which Henson calls attention to. The author describes the various forms of malarial parasites, their biological characters, and the various forms of pathogenic and non-pathogenic mosquitoes. The description of the pathology of the

disease is short but covers most of the ground. In the chapter on prophylaxis the various methods by which larvae may be exterminated are admirably set forth. The various methods of treatment of malaria are reviewed and the author's preferences indicated. The illustrations are mostly half-tone photographs and are only fair in quality.

Gout. Its Etiology, Pathology and Treatment. By JAMES LINDSAY, M.D. (Edin.), M.R.C.P. (Lond.), Hon. Physician, formerly Hon. Pathologist and Resident Medical Officer, Royal Mineral Water Hospital, Bath. Duodecimo; 212 pages. London: HENRY FROWDE, Oxford University Press, and HODDER & STOUGHTON, 1913.

The discussion of the etiology and clinical phenomena of gout leaves nothing to be desired. The chapter on the chemistry of gout reveals acquaintance with modern studies. In the treatment, the author recommends the usual measures and regards colchicum as a specific. No mention is made of some of the newer drugs. The spa treatment is discussed fully, and the value of the various English and Continental spas are weighed in the balance. The author has evidently a wide experience with this disease, and has made a useful manual.

The Problem. The Autobiography of a Physician. By CHARLES PERCY, B.Sc., M.D. Duodecimo; 128 pages. New York: THE SHAKESPEARE PRESS, 1913.

The title of this book is well chosen, whether the author intended that it should connote the subject of his thesis or the state of mind of the reviewer as to the character of the book. The book may be regarded either as a quasi-metaphysical disquisition on sleep or as a ghastly fantastic tale. Whatever it is, it is tiresome, long drawn out and without point.

Collected Papers From the Research Laboratory. Parke, Davis & Co. Small octavo; 287 pages, Reprints Vol. I. Detroit, Mich., 1913.

The reprints collected in this volume represent work of high scientific value and reflect favorably upon the enterprise of the manufacturers. The papers include researches in botany, bacteriology, pharmacology and the internal secretions.

The Treatment of Rheumatic Infections. Octavo; 134 pages. Press of PARKE, DAVIS & COMPANY, 1913.

This book deals with the theory and practice of the rheumatism phylacogen. To those desiring to try this new method of therapy, it should prove a valuable manual.

Books Received

Anatomy and Dissector in Abstract. By STEWART L. McCURDY, A.M., M.D., author of "Oral Surgery," "Orthopedic Surgery," etc.; Professor of Anatomy and Surgery (Dental Department), University of Pittsburgh; Orthopedic Surgeon, Presbyterian and Columbia Hospitals, Pittsburgh, etc. Fourth edition. Vest pocket size; 372 pages; illustrated; flexible leather. Pittsburgh: MEDICAL ABSTRACT PUB. CO.

The Surgical Clinics of John B. Murphy, M. D., at Mercy Hospital, Chicago. Volume II, Numbers IV, I and II. Octavos; illustrated. Philadelphia and London: W. B. SAUNDERS COMPANY, 1913. Published bi-monthly. Price per year: Paper, \$8.00. Cloth, \$12.00.

The Practitioner's Case Book. For Recording and Preserving Clinical Histories. Prepared and arranged by the Editorial Staff of the *Interstate Medical Journal*. St. Louis: THE INTERSTATE MEDICAL JOURNAL CO.

A Résumé of Recent Literature

The Chinese Style of Career of the Chinese Youth

$$S_1 = \{x_1, x_2, \dots, x_n\} \quad \text{where } x_i = (i, i) \quad \text{for } i = 1, 2, \dots, n$$

cyst, both in the early symptoms and in the radiographs of the early stages of growth. The case moreover emphasizes the need of taking a radiograph of every case of fracture due to slight violence; and also shows that giant-cell sarcoma of the long bones is of slow growth and proceeds with no metastases.

Synovial Lesions of the Skin. O. S. ORMSBY, Chicago. *The Journal of Cutaneous Diseases*, November, 1913.

The condition, first described by Hyde, consists of one or more wart-like projections, always over the side of bursal connected with tendons that traverse the small articulations of the hand and foot. The lesions are most often encountered over the metatarsophalangeal articulation or, in the hand, over the dorsal surface of the distal articulations of the thumb and index fingers. The form generally seen is a pea-sized, roundish mass, the center yellowish; the lesion is of long duration and quite insensitive. A peculiar fluid, syrupy and of a yellowish color, escapes when the mass is punctured, and promptly recurs even after the puncture. This fluid is not found in any other condition. Hyde states that "in every case the contents of the lesion are supplied by a synovial bursa beneath the skin, with which the lesion is either directly connected, or in communication by a short sinus."

Excision of these lesions, whose etiology is as yet very obscure, is followed by recurrence; radiography, on the other hand, resulted in cure in the four cases reported by the author.

A Preliminary Report on 120 Cases of Tuberculosis Treated With Friedmann's Vaccine. H. L. BARNES, *The Providence Medical Journal*, November, 1913.

Summarizing the report of 120 cases of tuberculous disease treated by the Friedmann vaccines at the State Sanatorium, R. I., Barnes says: The vaccine bacilli were not always acted fast. One injection of vaccine was harmless to guinea-pigs and turtles. Fourteen per cent of patients had fever reactions above 100°. Inoculation induration after first injection was present in 70 per cent. The average duration of the induration was 41 days. Abscesses occurred in 23 per cent. The average duration of discharge from the abscesses was 23 days. The cough and expectoration showed no striking improvement. Bacilli persisted in the sputum in 85 per cent of positive cases. The usual appetite continued, except in reacting patients in whom it was worse. Vaccine patients lost more weight than others. Twenty per cent had improvement in chest-pain the remainder being unchanged or worse. Patients had more fever and night sweats after the vaccine than before. Blood spitting was as frequent after as before vaccine treatment. There was no unusual tendency towards disappearance of physical signs, which were increased in many patients who were improving before. Forty per cent of the 85 patients whose present condition is known at an average period of four months after the first injection are worse.

Conclusions: 1. This report offers no evidence as to whether or not the vaccine can prevent tuberculosis in those who are free from it, as no healthy persons were inoculated.

2. It offers no evidence as to the liability of the vaccine to induce local or general tuberculosis, as this can be determined only by autopsy or special bacteriological work.

3. One patient with joint tuberculosis showed striking improvement, which makes it desirable that similar patients who have received this vaccine should be observed and reported on by those who have had orthopedic experience. The four other patients having active tuberculosis outside the lungs have not shown unusual improvement.

4. The 120 patients having pulmonary tuberculosis have shown none of the immediate and wonderful results reported by Friedmann and others before the Berlin Medical Society. On the contrary, about 17 per cent of the cases have shown an increased activity of the disease, which would not have been expected under ordinary sanatorium treatment. The permanent good or harm done these patients can only be measured with reasonable accuracy from one to three years after the administration of the vaccine.

The Prognostic Value of the Evidence of Streptococci in the Vaginal Secretion of Women in Labor. (*Über die Prognostische Bedeutung des Nachweises von Streptokokken im Vaginalsekret Kreisender.*) MARGARETE GOLDSTROM, *Zentralblatt für Gynäkologie*, No. 40, 1913.

In 902 women examined during the period of labor, streptococci were absent in 514 cases, anhemolytic streptococci were present 369 times and hemolytic streptococci were found 19 times. The outcome of these labor cases was varied and classified according as to the method employed in the delivery. The author's conclusion is that the prognosis for women who enter the clinic without fever is absolutely independent of the presence of streptococci in the lower third of the vagina.

The Trendelenburg Posture in the Reposition of the Retroflexed Uterus. (*Beckenhochlagerung bei Retroflexion des Retroflectierten Uterus.*) DR. LIEBL, *Zentralblatt für Gynäkologie*, No. 40, 1913.

The elevation of the pelvis as recommended by Trendelenburg has been found serviceable in the attempt at reposition of the retroflexed uterus. It is especially helpful in retroflexed gravid uteri. In some cases the very postural change induces spontaneous reposition.

Pigmentation of the Nails During Pregnancy. (*The Role of the Glands of Internal Secretion in the Genesis of Fibroma Molluscum Gravidarum, Together with a Description of the Pigmentation of the Nails in Pregnancy.*) SAMUEL M. BRICKNER, *New York. Surgery, Gynecology and Obstetrics*, October, 1913.

Brickner describes a perpendicular pigmentation of the nails arising in the fourth month of pregnancy. The color was at first light brown, but became much darker as the pregnancy advanced. Eighteen months later the pigmentation was still present, but was not as dark as it had been. Photographs accompany the article.

A Contribution to the Histogenesis of Sarcomatous Changes in Uterine Fibromyomata. SAMUEL H. GEIST, *New York. American Journal of Obstetrics*, December, 1913.

Geist has studied the material in the Mt. Sinai Hospital laboratory and has found two cases in which it was possible to trace the origin of the sarcoma cells from the muscle cells of a fibromyoma. In other cases, the interstitial tissue of a myoma, the adventitia and endothelium of the lymph and blood-vessels have been seen to be the origin of the malignant change. To these, Geist adds the muscle cells as a source of the neoplastic change.

Cardiac Disease and Pregnancy. (*Herzfehler und Schwangerschaft.*) P. KREISS, *Dresden. Zentralblatt f. Gynäkologie*, December 13, 1913.

The author sums up his conclusions as follows: 1. In cases of mild decompensation, absolute rest in bed, with a careful control of the specific gravity, amount and contents of the urine. 2. If the symptoms of decompensation do not disappear in a few days, digitalis, caffeine and alcohol are administered. 3. If the edema and ascites, the dyspnea and cyanosis and extra-systolic beats do not disappear, and if the amount of urine becomes diminished while the specific gravity rises, and if casts are found, the interruption of the pregnancy must be considered. 4. Induction of labor is also indicated in cases of congenital stenosis of the pulmonary valve, of pericarditis and of combined endocarditis and myocarditis. It is also to be resorted to if the cardiac disease is complicated by tuberculosis, pernicious anemia or large goiters.

The Treatment of Sterility by the Dudley-Reynolds Operation. F. C. HOLDEN, *Brooklyn. American Journal of Obstetrics*, December, 1913.

Holden, from an extended experience, concludes that the Dudley operation takes the cervix out of the axis of the

than any other condition of the kidney. Even with the aid of the newer methods a definite pre-operative diagnosis is sometimes impossible. In the majority of cases there is a renal distention showing itself by a lumbar or abdominal swelling. In a smaller number there is no swelling present and the affected organ is atrophic. The pathologic changes are not limited to the kidney and ureters, the infection may extend elsewhere by rupture of the sac or indirectly through the lymphatics. The bladder may also become secondarily infected. The cases can be divided into the following three groups: 1. The bladder is tuberculous. In the region of the supposedly diseased kidney a large tumor, the pyonephrotic sac is found. The ureter on this side is impermeable. Diagnosis is easy. 2. The bladder is normal. One ureter is impermeable, and on this side there is a tumor in the kidney region. Diagnosis is possible from the history of the case, and symptoms referable to other organs. 3. The tuberculous involvement of the bladder is far advanced, and cystoscopy is impossible. An enlarged kidney can be palpated. Diagnosis is possible only by exploratory incision. The enlarged kidney may be healthy and only hypertrophied, while the other kidney is atrophic and tuberculous. In the case reported the abscess was opened and temporary improvement followed, but profuse discharge continued, and a second operation had to be done. The bladder was also infected from the first, though there was no marked ulcerative cystitis, which had been observed by another physician previously. This had apparently cleared up and disappeared, and shows how the bladder tuberculosis sometimes heals when the primary source of inflammation has been removed. Another feature of the case was the rupture of the abscess through the diaphragm, causing a tuberculous empyema, and still another was the formation of a fecal fistula through the operation wound, accounted for by the removal of support of the weakened and adherent bowel by drainage of the abscess.

The Treatment of Dysmenorrhea With Atropin.
(*Zur Atropinbehandlung der Dysmenorrhoe.*) J. NOVAK, Vienna. *Wiener Medizinische Wochenschrift*, December 11, 1913.

Novak holds atropin in high esteem for the treatment of dysmenorrhea. In 38 patients in whom this drug was tried, the pain either completely disappeared or was very slight. The drug is given only during the menstrual flow and in doses of 0.005 three times daily, or in suppositories (0.001) once or twice daily. The article concludes with a discussion of the physiological rationale of this form of therapy.

The Elimination of Ascites. (*Zur Beseitigung des Ascites.*) J. KUMARIS, Athens. *Centralblatt für Chirurgie*, December 13, 1913.

Kumaris comments on the inadequacy of the current surgical methods of treating ascites, such as the Talma operation, anastomosis of the peritoneum to a vein, etc. On physiological and experimental grounds, Kumaris advocates the removal of large portions of the parietal peritoneum, thereby enabling the ascitic fluid to become absorbed by the lymphatics of the bare tissues. The operation, briefly, consists in removal of large areas of peritoneum of the anterior abdominal wall, over the diaphragm, the liver, the spleen and near the hilus of the kidney. In one case the result was brilliant up to the time the patient died from facial erysipelas twenty-two days after operation. While Kumaris rightly holds that the period of observation is too short, he nevertheless believes that on purely theoretical grounds the operation deserves trial.

Diaphragmatic Friction, an Early Symptom of Gastric Perforation. (*Das Zwerchfellreiben ein Frühsymptom der Magenperforation.*) A. BRENNER, Linz. *Wiener Medizinische Wochenschrift*, November 27, 1913.

In five or six cases of perforation of the stomach following ulcer, Brenner found a peculiar metallic tinkling friction sound on the sides of the abdomen below the in-

sertion of the diaphragm. This sound is due to the rubbing of the air-containing gastric contents against the dilated stomach. Brenner obtained this sign in the very earliest hours after perforation, even as early as one and a half hours after.

Comminuted Fractures of the Clavicle. (*Fractures Comminutives de la clavicle.*) A. MOUCHET and O. PIZON, Paris. *Paris Médicale*, November 15, 1913.

Comminuted fractures of the clavicle are important, especially on account of the deformity caused by excessive callus, and second, because of the danger of splinters injuring the brachial plexus. The authors have had the opportunity of observing four cases, and these are reported in detail. Two were occasioned by direct violence, but the other two followed a fall on the shoulder. Clinically, these cases showed a marked difficulty in reduction and in keeping the fractured parts in position. This made the physician suspect an intermediary fragment of bone. Even with the x-ray this fragment is hard to see because it is usually placed behind the lower border of the bone. All four cases were treated by an open operation, removal of splintered bone, and wire suturing of the fragments. The results in all the cases were excellent.

Case of Embolus in the Abdominal Aorta, Operation, Cure. (*Fall von Embolus Aortae Abdominalis, Operation, Heilung.*) F. BAUER, Malmö, Sweden. *Zentralblatt für Chirurgie*, December 20, 1913.

The patient was 39 years old and had suffered from mitral disease of rheumatic origin for many years. The patient was suddenly seized with severe pains in both lower extremities and paralysis. The pulse was 92, irregular; the skin over the lower extremities was cyanotic, livid, cold and anesthetic. The femoral pulses were impalpable. The diagnosis of embolus of the aorta above the bifurcation of the iliacs was made. Under a general anesthetic the aorta was exposed and was found to pulsate above the bifurcation, but both common iliac arteries were pulseless. After compressing with the fingers, the aorta was opened, exposing the embolus which was easily removed. The embolus was 3 cm. long and was the shape of a bicuspid tooth, each cusp having fitted into the common iliac arteries. The patient stood the operation well and made a perfect recovery.

Subpectoral Abscess. Report of a case. C. LEGIARDI-LAURA, New York. *Medical Record*, January 3, 1914.

This is a rather rare condition, but of much interest; first, because it is often difficult to diagnose; second, because the mortality is very high. The abscess may be situated under either the pectoralis major or the pectoralis minor muscles. The starting point of the infection is usually in the axillary or subclavian lymph nodes. The onset of the symptoms is accompanied by high fever and pain in the chest, suggesting a pulmonary condition. Local bulging is a late symptom, especially if the abscess is under the pectoralis minor. This is why the condition is so infrequently diagnosed in its early stages, and why in consequence the mortality (from sepsis) is high. The author reports a case with recovery.

Operation for Aneurism by Bloodvessel Transplantation. (*Zur Operation des Aneurysma mit Gefäss-transplantation.*) E. UNGER, Berlin. *Berliner Klinische Wochenschrift*, November 24, 1913.

Unger reports three cases. The first was a popliteal aneurism which he resected and restored the continuity of the vessel by implanting a section of the saphenous vein 15 cm. long, using the Carrel suture. The result was perfect. The second was an arteriovenous aneurism of the femoral artery. The operation necessitated extirpation of the aneurism, suture of the femoral vein and transplantation of the saphenous vein into the defect in the femoral artery. This case also was successful. In the third case, an aneurism of the popliteal artery, transplantation of the saphenous vein was again attempted, but was unsuccessful owing to the difference in caliber between the vessels. Gangrene resulted, necessitating amputation.

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TREATMENT OF CERTAIN CASES OF PROSTATIC OBSTRUCTION BY CAUTERIZATION BY THE HIGH- FREQUENCY CURRENT

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It seems to me the two points to be established are that it is possible to destroy prostatic tissue by the high frequency current, and that this is a perfectly feasible means of eliminating a prostatic obstruction in certain cases. I wish to present the following clinical observations upon which are based my belief in the affirmative side of both of these questions.

On cystoscopic examination of cases treated by this method, I could see a gray and black necrotic area at the site of a previous treatment, and repeated application of the Oudin current would produce in each instance a gradual disappearance of tissue at this spot. The most pronounced evidence on this point was in a case of middle lobe of prostatic obstruction. The lobe was of moderate size, could not be brought into one field of the cystoscope, and had the ureteral orifices from each side almost completely occluded. Manipulation of the ureters with the ureteral orifices into the field of vision, together with the high frequency current, was indicated on several occasions, and each time a small area of the surface of this intralobular growth was cauterized. The cautery, a fine vaporization, but the repeated action, so repeated that after three treatments it could be brought wholly within the field of vision, at least ureteral orifices were visible. After the fourth treatment, the middle lobe no longer existed, but it was replaced by a broad area of necrotic tissue.

The efficacy of this method of treatment in the two following cases previously reported in the Medical Literature of 1923 is more eloquent demonstration of the interference by the high frequency current of the growth of prostatic tissue in certain instances. These patients represent different types of obstruction. The histories were as

follows: "The patient, a married man, 50 years of age, had been suffering for several years with urinary obstruction. He had been treated by the cystoscopic method, and had been told by his physician that the prostate was enlarged. He had been told that the prostate was enlarged, and that the prostate was enlarged, and that the prostate was enlarged." "The patient, a married man, 50 years of age, had been suffering for several years with urinary obstruction. He had been treated by the cystoscopic method, and had been told by his physician that the prostate was enlarged. He had been told that the prostate was enlarged, and that the prostate was enlarged."

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*Read before the Section on Urology, American Medical Association, Chicago, Ill., May 1923.

cystoscopy, the site of the previous cauterization was clearly marked by the presence of gray and black necrotic tissue, and a distinct depression at this point was evident. On September 25th and again on October 14th of last year, in addition to making further excavation in the posterior region, I burned a small trough in the left anterior, and one in the right anterior aspect, carrying each about a half inch into the prostatic urethra. I question whether these anterior burns were productive of good, and am inclined to credit the subsequent improvement to the widening and deepening of the posterior notch. At any rate, after the first of these two visits, the residual urine dropped to 5 ounces; and after the last one, to 1½ ounces. Three weeks later it was 1½ ounces; and six months later, it was still 1½ ounces. At this visit the patient voided 22 ounces at one time. Needless to say, the symptoms improved steadily during the course of treatment. The enuresis ceased; the patient did not rise at night to urinate; and the interval between urinations in the day time was often six hours. In all, cauterization was done six times, and the total time of application of the Oudin current was about 18 minutes.

The second patient was 65 years old, had had frequency of urination for many months and enuresis every night for six months. At the time of the first examination, October, 1912, he was voiding 6 to 8 times a night and at intervals of 1 to 2 hours in the day, always with hesitation and some difficulty. The urine was perfectly clear; the residual urine, measured on several occasions, varied from 13 to 15 ounces. The prostate per rectum was not markedly enlarged. Cystoscopy revealed a median lobe, but no other intravesical projections of the prostate. This is the case referred to the first part of the paper. Briefly, the Oudin current was applied to this middle lobe on six different occasions; in all 9½ minutes. The cautery action was not deep, but repeated application caused the disappearance by necrosis of the whole lobe. Three and five weeks after the last treatment, the residual urine was respectively ½ and ¾ of an ounce. The symptoms were entirely relieved. Recently I heard from this patient (who is out of town) that he frequently goes six, even eight, hours without urinating.

Both of these patients tolerated instrumentation so well, that not even local anesthesia was used. Neither patient had post-operative pain nor hemorrhage of any consequence.

I have at present under observation an old gentleman who had had three cutting operations upon his prostate before I saw him. He had frequency of urination, residual urine varying from 3 to 6 ounces. His prostate viewed through the cystoscope was very irregular and presented a median bar. I first burned away a small lobe of prostate which projected from the left posterior aspect of the prostatic border (and which I thought might have fallen over the vesical outlet during urination), without improving the

symptoms. Subsequent treatment of the median bar has reduced the residual urine to 1½ ounces, and has produced a well defined excavation in the prostatic tissue. These observations are too recent to establish clinical betterment, but the case illustrates graphically the ability of the high frequency current to destroy prostatic tissue. This patient is still under treatment.

Two patients seen at the Presbyterian Dispensary, with enlargement of both lateral lobes, who had flatly declined operation, I undertook to treat with the high frequency current, wondering whether it would be possible to help them. But both complained so bitterly of any instrumental examination, I gave up after one treatment in each case.

I am far from advocating this mode of treatment for large hypertrophies. The great majority of all cases of hypertrophy of the prostate I believe are much better treated by open operation. With this small experience in the treatment of prostatic obstruction by the high frequency current, I am inclined to reserve it for instances in which a comparatively small portion of prostate at the vesical neck is causing a relatively large degree of obstruction. Possibly it may afford, at least partial relief in other types of cases and may reasonably be tried when there exists some strong objection to prostatectomy. But with the Oudin current, a single cauterization is not deep, and progress made in destroying prostatic tissue is slow as compared with results obtained with papillomata of the bladder.

Prostatic hypertrophy is a condition of slow growth. Frequently the prostate has reached great size before symptoms develop, and only a little additional growth may produce great discomfort. In such a case of general enlargement, one may produce a considerable degree of relief in cauterizing troughs in enlarged lateral lobes, but it is obvious that a recurrence of symptoms might readily be produced by further slight growth of the tumor mass. On the contrary, in the types of cases regarded as especially suitable for the high frequency current, especially those in which the entire obstruction is due to a middle lobe which can be entirely eradicated, the prognosis is certainly excellent.

A very practical consideration always is whether the patient takes kindly to instrumentation. Intolerance to the cystoscope after good local anesthesia may easily turn the tide in favor of operation in a case otherwise regarded as suitable for this simple procedure.

STRAIGHT-DIRECT LARYNGOSCOPY, BRONCHOSCOPY, AND ESOPHAGOSCOPY

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ANATOMY, PHYSIOLOGY, AND PATHOLOGY

BRONCHOSCOPY AND ESOPHAGOSCOPY

ANATOMY AND PHYSIOLOGY

The Larynx. When the direct laryngoscope is introduced, the tongue is pushed up on the wall to bring the epiglottis into view, the lingual surface of which appears covered with light pink mucous membrane traversed by several large blood vessels. The edge of the epiglottis presents a narrow ledge covered with pale membrane, thicker in some individuals than in others. The valleculae are about as distinct as with the mirror. The lingual surface of the epiglottis is not of uniform thickness clinically because pathological lesions are not often located there. Occasionally one sees a tubercular induration or ulcer along the edge of the epiglottis which can be successfully removed through the direct laryngoscope. The large lingual surface of the epiglottis can be satisfactorily exposed through the tube by placing the lingual end of the instrument along the inner border of the epiglottis and exerting a fulcring fulcrum effect. The epiglottis can be used to remove a large growth from the right laryngeal epiglottic surface through the direct laryngoscope. In order to get a fulcrum effect the larynx is raised, the spatula end of the laryngoscope is slipped below the pulling the entire epiglottis upward. The arytenoid cartilages and the aryepiglottic folds are seen first. The arytenoid cartilages are seen as two bright, opposed to their anterior margin the corniculate appear as rounded nodules. The arytenoid cartilage size free of the corniculate margin is about the size of a larger intestine. The posterior surface is smooth and slightly concave posteriorly in the middle line. Passing outward from the middle line the folds extend forward to the epiglottis and are called the aryepiglottic folds. Intercorniculate folds are the folds of the larynx which are found between the corniculate cartilages. With the direct laryngoscope the corniculate cartilages

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lobe bronchus may rise at the level of the bifurcation spur or even from the trachea. The left upper bronchus arises much lower down than the right. The right middle lobe bronchus arises some distance below the upper and runs forward. The bronchi to the lower lobes on both sides are known as terminal bronchi and ramify anteriorly and posteriorly like the fingers of a glove. The rings of the trachea number from sixteen to twenty and are open in their posterior third. In the main bronchi the right has from six to eight and the left from nine to twelve cartilaginous rings. Below the origin of the upper lobe bronchi on each side, the bronchi have cartilaginous plates which often coalesce and are scattered over the entire periphery. Their thickness constantly decreases until in tubes of 1 millimetre they are completely absent. This arrangement increases the elasticity and movability of the smaller bronchi which have an important bearing on the removal of foreign bodies. The upper part of the posterior wall of the trachea touches the esophagus. In books on topographical anatomy the bifurcation is said to correspond to the sternal end of the second costal articulation and behind with the spinous process of the fourth dorsal vertebra. In children the numbers would be three and five respectively. Brunings does not agree with these figures. From skiagrams (the dead body being absolutely horizontal and the picture taken from a distance of 200 cm.) the bifurcation in the case of a 12-year-old girl is situated at the lower edge of the first sterno-costal articulation; in the case of a new born child halfway between the first and second articulations; in a 16-year-old girl it approaches the upper edge of the second sterno-costal articulation and in an adult it coincides with it.

Relative Lengths of the Bronchial Tree (Brunings).

Lengths.	Man. Cm.	Woman. Cm.	Child. Cm.	Infant. Cm.
Trachea.....	12	10	7	4
Right main bronchus.....	2.5	2	1	0.5
Left main bronchus.....	5	4.5	3	1.5
Right trunk bronchus.....	3.5	3	2	1
Left trunk bronchus.....	2	1.5	1	0.5
If the rectilinear distance from teeth to trachea is added.....	12	13	10	12
There is thus as total distance between upper teeth and bifur- cation.....	26	23	17	12
And as total distance between upper teeth and lower lobe branches.....				
Right.....	32	28	20	13.5
Left.....	33	29	21	14

"In this table the term 'child' implies the age of about ten years. The numbers in this column have only a limited application, because there is, of course, a considerable interval between 'infant' and 'woman.' The autoscopic numbers for infant and child are doubtful because they depend solely on estimates."

Relative Calibre of the Bronchial Tree (Brunings).

Diameters.	Man. Mm.	Woman. Mm.	Child. Mm.	Infant. Mm.
Trachea.....	15-22	13-18	8-11	6-7
Right main bronchus.....	12-16	10-15	7-9	5-6
Right trunk bronchus.....	9-12	8-11	5-7	4-5
Left main bronchus.....	10-14	9-13	6-8	4-5
Available width of glottis.....	12-15	10-13	8-10	5-6.5

"By the trunk bronchus is meant that part of the bronchus below the branches to the upper lobes of the lungs. These numbers in themselves afford considerable scope, but in practice it must be remembered that all parts of the tracheo-bronchial tree are capable of a not inconsiderable power of stretching. I have therefore given rather high values for the available width of the glottis (the width which the tube can traverse) in the case of a child or infant, as compared with the figures of the bronchial tree, because a child's larynx is more expandible. In practicing endoscopy, unless there is a special reason for the contrary, it will be advisable to adhere rather to the lower figures as regards the width of tube, as by this investigation is made less troublesome and the mobility of the tube greater. It may be taken as a rule that a tube of a width that can pass the larynx without difficulty can also enter the two main bronchi. Jackson's statement that a tube of more than 10 millimetres cannot be passed through the larynx 'without risk of injury,' does not at all apply to the sloping tube spatula of my extensible bronchoscope."

In a large number of bronchoscopic examinations, the writer has never observed movements of the trachea and bronchi synchronous with respiration except in young children in whom the lumen of the different parts of the respiratory tree may completely disappear during expiration. As the bronchoscope approaches the bifurcation, the pulsations of the heart become very distinct and almost frighten the beginner with the force of the impulse. The movements occur with the systole of the heart. They are of diagnostic importance because they may be greatly increased in aneurysm of the aorta. The proximity of the pulmonary arteries causes pulsation in the larger bronchi which are sometimes so marked as to produce narrowing of the tubes.

The esophagus. The following description of the esophagus is taken from Brunings: "Killian was the first to show that the tonic and sphincter-like occlusion of the superior extremity of the esophagus is confined to the region of the lower border of the cricoid cartilage, where the lowest transverse bundles of fibres of the constrictor pharyngis inferior form a lip-shaped prominence on the posterior pharyngeal wall. This muscular band, whose sphincteric action can only be observed in the living body, thus represents the lower limit of the hypo-

pharynx and the beginning of the esophagus, the walls of which are supported in part by the cricoid plate, behind by the vertebral column, and at the sides by the more or less strongly developed lobes of the thyroid glands. The cervical portion of the esophagus occupies the median line between the vertebral column and the trachea, and with the latter enters the posterior mediastinum. As a rule the thoracic portion of the esophagus will be found here, now continues to swing a little to the left of the median line, thus reaching the extramedian position of the pars distalis. In contradistinction to the statements in the older anatomical atlases, the fact must be emphasized that the esophagus does not wind up the vertebral column like a climbing plant, but that, on the contrary, its course is so straight that in certain circumstances a view of the lumen may be obtained from its commencement almost as far as the cardia.

The direction of the deviation in the thoracic portion is determined in living persons simply by the relation of the esophagus to the neighboring organs; its left wall, and lower down its posterior wall, immediately adjoins the aorta, whereas the trachea, and below it the heart lie immediately anterior. There is a constant physiological curvature of the lower thoracic portion forwards and to the left, which is important to bear in mind in direct examination. Immediately after the region of the bifurcation the esophagus gradually assumes a position in front of the aorta, thus getting away more and more from the vertebral column. The variable degree of mobility of the several portions of the esophagus are of practical importance in regards examination. It is only the region of the upper esophageal orifice which is comparatively fixed, but the movements of the pharyngeal constriction in deglutition, as indicated by the rising of the larynx, show that it must be partly a fixation caused by reflex muscular contraction. As a matter of fact, the passive mobility of this region is considerably increased during deglutition. According to Jackson, the tube can make lateral excursions several centimetres in extent. As to the extremely loose tissue of the lower esophagus, it admits of a considerable lateral displacement, the amount of which is only somewhat limited in the neighborhood of the bifurcation by its intimate solid connection with the pericardium and the peribronchial connective tissue, which, rather stiff, near the diaphragm, it decreases considerably. The mobility of the lower esophagus, of course, is of the esophagus, viz., the lungs, and of the diaphragm, of course, very greatly on the state of contraction of the diaphragm. In normal and erect position

the lower esophagus is much less than is the upper, and it is almost completely hidden by the lungs. It almost disappears when the patient breathes convulsively. The lower esophagus, and, Jackson, was able to describe the lungs by 15 cm. laterally and 5 cm. in a deep central direction, in a patient who was deeply anaesthetized. He has collected all the literature bearing on the topographical relation of the esophagus to the vertebral column, and has thus arrived at the conclusion, saying that its position most often corresponds to the level of the eleventh thoracic vertebra.

According to the observations of Hoyer, Strack, and others, in the living subject, I find that the position of the esophagus in the thorax is not constant. The point of relation to the cardia, as stated by the different authors, is from 20 to 35 centimetres. The average 24 cm. is most frequently met, and may therefore be taken as the average value. For practical reasons it is important to know the several degrees of mobility of the upper row of teeth, the upper esophageal orifice, and the lower esophagus, they may be palpable separately, and a guide to the location of the esophageal orifice. The following table contains the measurements of the thorax, which are found among the cases of the esophageal area uregents. It concerns only the figures relating to children, it must be observed that in many cases they are not very regular measurement, so that they should by no means be taken as law. Nevertheless, the table is of considerable value, and will probably be of interest to all the physician.

Age	Height	Weight	Length of thorax	Length of upper thorax	Length of lower thorax	Length of upper esophagus	Length of lower esophagus	Length of total esophagus
1	75	10	25	15	10	15	15	30
2	85	12	28	18	10	18	18	36
3	95	15	30	20	10	20	20	40
4	105	18	32	22	10	22	22	44
5	115	22	35	25	10	25	25	50
6	125	28	38	28	10	28	28	56
7	135	35	40	30	10	30	30	60
8	145	45	42	32	10	32	32	64
9	155	55	45	35	10	35	35	70
10	165	65	48	38	10	38	38	76
11	175	75	50	40	10	40	40	80
12	185	85	52	42	10	42	42	84
13	195	95	55	45	10	45	45	90
14	205	105	58	48	10	48	48	96
15	215	115	60	50	10	50	50	100
16	225	125	62	52	10	52	52	104
17	235	135	65	55	10	55	55	110
18	245	145	68	58	10	58	58	116
19	255	155	70	60	10	60	60	120
20	265	165	72	62	10	62	62	124
21	275	175	75	65	10	65	65	130
22	285	185	78	68	10	68	68	136
23	295	195	80	70	10	70	70	140
24	305	205	82	72	10	72	72	144
25	315	215	85	75	10	75	75	150
26	325	225	88	78	10	78	78	156
27	335	235	90	80	10	80	80	160
28	345	245	92	82	10	82	82	164
29	355	255	95	85	10	85	85	170
30	365	265	98	88	10	88	88	176
31	375	275	100	90	10	90	90	180
32	385	285	102	92	10	92	92	184
33	395	295	105	95	10	95	95	190
34	405	305	108	98	10	98	98	196
35	415	315	110	100	10	100	100	200

Most important are the measurements in adults, and especially the knowledge of the fact that in the case of men the cardia may in some be reached 36 centimetres from the teeth, whilst in others the cardia may be 50 centimetres distant. It is found too, that the "normal" distance of 40 centimetres is subject to extraordinary variations. In women the corresponding numbers are 32 and 41, giving a mean of 38. It is important also to know the distance in a straight line between the teeth and the mouth of the esophagus. It does not vary much and is about 15 centimetres in men and 14 in women. The walls of the esophagus are from 3 to 4 mm. thick.

Movements of the Esophagus as Seen Through the Esophagoscope. In opening the upper end or mouth of the esophagus no movement of the walls is seen. Further down in the cervical portion very slight if any movement can be noticed. When the esophagoscope reaches the dorsal portion of the tube, the lumen increases on inspiration and decreases in size on expiration. These variations are valuable in showing the operator the direction in which the tube should go. The mouth and cervical portion of the esophagus represent a transverse slit while in the dorsal region the shape is distinctly oval in character.

CHAPTER IV.

DIRECT LARYNGOSCOPY.

1. HISTORICAL.

In 1804 Kirstein proposed to examine the larynx directly by means of a special spatula terminating in a pronged end for pulling the epiglottis forward. He published articles and photographs showing the position of the head which simulated some of the positions used now. His source of light was an ordinary mirror or an electric head light. Kirstein must have gotten a good view of the larynx since his spatula was shaped like some used now, but for some reason laryngologists did not adopt his method. It was the case that his instrument was bought but never used. Two years later Killian, profiting by Kirstein's work, placed direct laryngoscopy on a solid foundation by offering to the medical profession instruments of his own device which differed from the spatula idea in that he used regular tubes. His illumination came from an electric head light which Kirstein had devised and for some time this was the only method of lighting the tubes. While Kirstein first thought of direct laryngoscopy, Killian must be given the credit for placing it on a practical basis. In this country Jackson introduced laryngoscopes which carried the light on a light carrier at the end of the tube.

These instruments in the writer's opinion are still the best for larynx work, pure and simple, because they are more easily handled than the latest European idea. The hand light or electroscope of Brunings and Kahler are the latest ideas in illumination. Brunings' electroscope has been described and Kahler's is very similar to it. Mosher's instrument is still another spatula for examining the larynx. With all these instruments direct laryngoscopy has reached a high state of development and there seems no excuse for every laryngologist not to become expert with at least one of the methods.

2. INDICATIONS FOR DIRECT LARYNGOSCOPY.

The indications for direct laryngoscopy are so numerous that the writer feels justified in saying

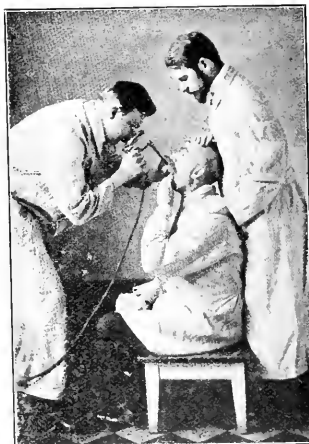


Fig. 1. Stages I. and II.: Recognition and passage of the epiglottis. Brunings.

that the only indication for the mirror or indirect method is in routine office work where time is an element of importance.

1. Those who are expert with the tube will never waste time trying to examine the larynxes of children with the mirror. It is not necessary to repeat here the difficulties of seeing the child's larynx with the mirror, for every laryngologist is familiar with them. The tube solves all difficulties by exposing the larynx in a few seconds.

2. Direct laryngoscopy has solved the problem of operating in the child's larynx. In papillomata and stenosis much can be accomplished in a short time as will be shown later on. It can be said absolutely that it is the only method of operating in the child's larynx.

3. In the removal of foreign bodies it is the only method worth while because one sees so much better than with the mirror. The object can be

grasped and manipulated if necessary, without the importance in some cases to prevent injury of the tissues.

4. In the removal of tumors and specimens for microscopic examination, the operation is more accurately done than with the mirror. Especially in the anterior commissure and on the cords anteriorly is the method of particular value.

5. The examination of the subglottic space is quickly made and pathological lesions seen which would be very difficult with the indirect method. In the same way the ventricles can be explored on the two sides.

6. The extent and limitation of malignant and tubercular growths are often of importance in giving

prognosis. They can be seen and measured, and not only the extent of the growth but the character of the growth can be determined. The direct method is especially valuable in the examination of the cords and the anterior commissure. In patients with the laryngeal tumor, the direct method increases the danger of the operation. It is better to use examination with the mirror. The direct method to relieve the larynx is not to be used in the early stages of the disease. The direct method is not to be performed in the early stages of the disease.

2. *Indirect method.*—The indirect method is the most common in the larynx. It is the most common in the larynx. While direct laryngoscopy is the most common in the larynx, the indirect method is the most common in the larynx.

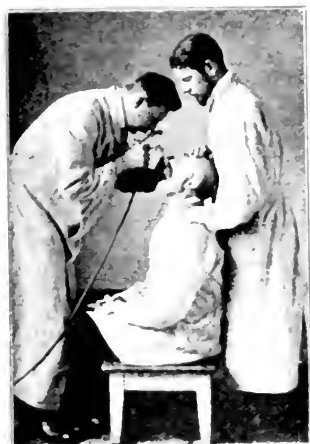


Fig. 1. Stage 1. Indirect method.

ing a prognosis or in determining the extent of the disease. It is the most common in the larynx. It is the most common in the larynx.

7. In a low hanging, encysted, or in extremely sensitive throat, the mirror is not to be used. It is the most common in the larynx. It is the most common in the larynx.

8. To get a better view of the larynx, the mirror is not to be used. It is the most common in the larynx. It is the most common in the larynx.

3. *CONTRA-INDICATIONS.*—The direct method is not to be used in the larynx. It is the most common in the larynx.

1. *Severe disease of the larynx.*—The direct method is not to be used in the larynx. It is the most common in the larynx.



Fig. 2. Stage 2. Indirect method.

2. *Severe disease of the larynx.*—The direct method is not to be used in the larynx. It is the most common in the larynx.

3. *Severe disease of the larynx.*—The direct method is not to be used in the larynx. It is the most common in the larynx.

4. *Severe disease of the larynx.*—The direct method is not to be used in the larynx. It is the most common in the larynx.

5. *Severe disease of the larynx.*—The direct method is not to be used in the larynx. It is the most common in the larynx.

able cases, that by introducing the spatula a long way and exercising a strong pressure a direct view of the arytenoid region may be obtained. This experiment, though in itself unimportant, has a certain importance as a preliminary, and should precede any direct laryngoscopy in order to ascertain to what degree it is practicable. It may be taken as a rule that autoscopia is the more easily performed in proportion to the degree of examination possible with the tongue spatula, but exceptions will no doubt occur. When the neck is short and the glottis is high, is often very easy to reveal a large portion of the lingual surface of the epiglottis, especially when it is considerably inclined in a posterior direction. Therefore when experimenting with the tongue spatula, it is necessary to notice the distance between the epiglottis or root of the tongue and the back of the throat. If the interval is small and cannot be much enlarged, even by considerable pressure, there will be difficulty in carrying out direct laryngoscopy even when the epiglottis is well in sight. The test with the tongue spatula should not be slurred over, as for one thing it affords a means of judging the endurance and reflex irritability of the patient. A long and slender neck and movable Adam's apple are always more favorable for the examination than a short and stiff neck, strong neck muscles and a short and thick tongue. This is the chief reason why women, children and old people are, in general, much better suited for autoscopia than strong men. One important criterion for the applicability of autoscopia, which will be repeatedly referred to later on and may be mentioned now, is the position of the upper incisors. When they are very prominent it is much more difficult to get the spatula in the direction of the trachea than when they are little developed or absent altogether. A gap of at least two teeth in the middle of the upper jaw considerably facilitates direct examinations."

The writer mentions these views of probably the most expert European laryngoscopist to disagree with them and to state that in his judgment practically every patient can be examined at the first sitting and that without the preliminary use of the spatula. The writer can truthfully say that during the last two years, he has not failed once to get a satisfactory view of the larynx at the first trial with the methods which he will describe later. With the proper position of the head and a small tube, direct laryngoscopy is one of the easiest procedures in surgery in experienced hands. In the Presbyterian Hospital the examination and operation, if one be necessary, are done at the same sitting and

the operation is concluded unless severe hemorrhage compels a second sitting. Having digressed to this extent to champion American methods as opposed to some of the best European, the writer will now describe Brunings' method and then compare it with the methods used in this country. Brunings says: "After the spatula has been fitted to the electroscope, the light arranged, and a damp rag placed ready for cleaning the mirror of the electroscope, if it should be required, the spatula for autoscopia and the mirror of the electroscope should be slightly warmed over a lamp, and all is ready for the actual introduction of the tube. The process may be divided into three stages in the



Fig. 4. Stage IV.: Deep introduction. Brunings.

case of all direct examinations of the air passages.

First movement: Bringing into view the lingual surface of the epiglottis.

Second movement: Passing beyond the epiglottis and pushing it aside.

Third movement: Pushing the tube deeper, possibly through the larynx.

First Movement. It is better to proceed as follows: The patient should bend his head back very little, and should hold his tongue fast with his left hand to prevent it moving inconveniently. The surgeon should then introduce the spatula exactly in the middle line, not too vertically, so that when the tongue is depressed the upper edge, *i. e.*, about 5 to 7 centimetres, of the epiglottis comes into view. The surgeon's eye should remain all the time close over the slit in the electrosopic mirror.

In order that the spatula, while being pressed down, may not slide off laterally or downwards

in the corner of the mouth. This will be dealt with farther on."

Brunings' method has been given verbatim in order to compare it with the American methods which seem much simpler. The method used by the writer is certainly easier and just as efficient for operative procedures. The unpopularity of tube work is due to the complicated methods of examination. The different methods devised in this country will now be taken up both in the sitting and the prone positions.

The usual method of direct laryngoscopy in the sitting position. The writer wishes to emphasize the fact that the examination is always easier in the sitting than in the prone position in adults.

The method to be described may be called direct laryngoscopy with the head in the Boyce position with the patient sitting. It was described by Jackson in his book on tracheo-bronchoscopy and, so far as I know, is still used by him. The patient is seated on a low stool—so low that when the operator stands in front of him, the instrument can be passed with the elbow and the hand in the same plane. This is a very important point for if the stool is too high successful work cannot be done. The next step is cocaineizing the pharynx with a curved applicator. After waiting a minute or two, the laryngoscope is passed straight down between the incisor teeth, pushing the tongue into the floor of the mouth. The head is extended more or less according to the size of the instrument. With the large Jackson tube the head must be thrown far back. The tube slips along the tongue until the epiglottis comes into view. Usually at this point more cocaine must be applied through the laryngoscope by means of straight applicators, the anesthetic being carried straight down into the larynx. By depressing the handle, the spatula end of the instrument is made to slide along the wall of the pharynx about a half or three-quarters of an inch. The handle is then raised bringing the spatula end forward and pulling the epiglottis forward with it. At this point one must pull considerably to see the larynx at all satisfactorily, and in many cases it is impossible to see the anterior commissure. With such a large instrument in some cases it is impossible to extend the head sufficiently to see the larynx. For this reason the writer soon gave up the large laryngoscope and tried the small instrument devised by Jackson for children. This tube is more easily introduced and works better in most cases but it was too large for some patients. The difficulties of holding the tube with one hand and operating with the other are great. Jack-

son advised that the larynx be exposed by manipulating the instrument and not by using force, but this did not work with the writer. In expressing the above views the writer wishes it understood that they are his own opinions and it is quite probable that others do not agree with him in his estimate of the Jackson tubes. The unsatisfactory results in direct laryngoscopy led the writer to experiment with the purpose of finding an easier method and one which could be used satisfactorily in every patient. In conversations with different laryngologists, he found that their troubles corresponded with his own. The great difficulty with all laryngoscopes is their large size which compels an unnatural position of the head and unnecessary and painful pulling on the instrument to accomplish any results. Long ago the writer found that it is just as easy to see through a smaller tube and, with a little practice, as easy to work through it. Besides, the ease of introducing the smaller tube and the absence of strain on the patient more than made up for the difference in size of the tubes. The laryngoscope to be described is the smallest one made and also the most satisfactory to those who have used it or have seen it used because it removes all natural difficulties of the operation and makes direct laryngoscopy almost as easy as the indirect method. The instrument is used in adults and children for laryngoscopy and the examination of the upper end of the esophagus and thus does away with a multiplicity of instruments which is the bane of tube work. It has solved all the problems of direct laryngoscopy for the writer and he commends it to laryngologists as the simplest of all instruments. The important point in working through a small tube is in training the eye to the proper perspective and this is soon learned. One finds that the work through a small laryngoscope helps him greatly in operating through the still smaller bronchoscopes. Before dismissing the comparison of laryngoscopes, just a word as to their illumination may be said. However brilliant Brunings' electroscope may be for bronchoscopes, the writer believes from personal experience that the open tube with the light at the end is better for direct laryngoscopy. The light is bright enough for all purposes and one has the advantage of the open tube to operate through which is an advantage. In laryngeal work the mirror arrangement of the Brunings instrument is in the way of the large forceps which are generally used for operative work in the larynx. The instrument which the writer uses in all his short tube work is a modification of the old Jackson tube

— the first one he devised for "Childs." After the separable specula appeared, it fell into disuse, and was no longer made. The original instrument was 17 centimetres long and 10 millimetres in the inside diameter. It had a drainage tube which was practically never used and took up valuable space in the tube. The handle had no vertical part as the separable specula crossed so that it was not possible to exert any leverage on it. In using the instrument, the water had to be drained out, removed and a vertical handle attached which could be removed as may be necessary. The detachable handle makes the instrument doubly valuable, as will appear later. The tube has been described at length, because those who have seen it in operation become enthusiastic at its ease of introduction and exposure of the larynx.

Post-operative treatment

POST-OPERATIVE THROMBOPHLEBITIS

RAYMOND W. HILL, M.S.M.S.

CHICAGO, ILL.

Post-operative thrombophlebitis was described by the late Maurice Richardson among the avoidable Calanities Following Surgical Operations. Its occurrence after echotomies is a most distressing complication, because of the potential embolism, but the prolonged period of recovery, and the more or less disabling sequelae to the patient also make the subject of large importance in the perfection of surgical technique.

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the first one he devised for "Childs." After the separable specula appeared, it fell into disuse, and was no longer made.

The original instrument was 17 centimetres long and 10 millimetres in the inside diameter. It had a drainage tube which was practically never used and took up valuable space in the tube. The handle had no vertical part as the separable specula crossed so that it was not possible to exert any leverage on it. In using the instrument, the water had to be drained out, removed and a vertical handle attached which could be removed as may be necessary. The detachable handle makes the instrument doubly valuable, as will appear later. The tube has been described at length, because those who have seen it in operation become enthusiastic at its ease of introduction and exposure of the larynx.

Post-operative treatment

POST-OPERATIVE THROMBOPHLEBITIS

RAYMOND W. HILL, M.S.M.S.

CHICAGO, ILL.

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The superficial distribution of veins submits them to outside pressure and injury.

Large varicosities in the lower limbs afford a predisposing cause.

The veins of the lower extremities are often dilated and their walls diseased by the pressure of intra-abdominal tumors or inflammatory masses.

Kelling⁸ has recently done special experimental work along this line, and concludes that infection is the *prime cause*, arising either through a low grade infection in the natural clot behind a ligature, which disintegrates and is carried in the circulation to other points where thrombi develop, or from stitch abscesses where infection travels directly through the superficial or deep epigastric veins to the femoral or iliac vessels.

Clark⁹, from clinical and experimental work, concludes that traumatism during operation exerted upon the deep epigastric vein, causes the primary thrombosis which slowly progresses through the vessel until it reaches the external iliac, where it gives rise to a retrogressive thrombus in the femoral vein.

Traumatism of the pelvic tissues, during extensive operations upon the vagina, rectum, cervix or perineum, rarely gives rise to a thrombo-phlebitis. However, in Cordier's¹⁰ series of 232 cases following abdominal and pelvic operations, 9 followed vaginal hysterectomy for cancer, and 8 followed vaginal operations, their character not stated. It has occurred rarely following curettages and perineorrhaphies.

Let us consider briefly the anatomy of the pelvic venous system. The uterine and vaginal plexuses empty into the internal iliac. The hemorrhoidal veins terminate in the internal pudic which empties into the internal iliac. The superficial epigastric empties at right angles into the femoral; the deep epigastric and deep circumflex iliac into the internal iliac immediately above Poupart's ligament. It is clear, then, that infections following operations upon the rectum, perineum, vagina, or upon the uterus, ovaries, tubes or broad ligament, if carried by the veins might *rarely* produce a septic thrombosis of the portal vein, but *usually* a septicemia or a pyemia.

The frequency of puerperal septic thrombo-phlebitis has recently been studied¹¹. Williams estimates that one-third of all women dying of puerperal infection showed septic thrombosis. Lennhartz placed it at 50 per cent.; Trendelenburg the same, and Kneise somewhat less. Seeger established the fact that these thrombo-phlebitic processes are, in the majority of cases, pure; in other words,

confined to the veins. In 31 cases he found only 5 times a combination of thrombo-phlebitis with lymphatic processes, the rest being pure pyemia.

From our present knowledge we must conclude, then, that there are two undoubted primary factors: Traumatism of the abdominal wall, especially of the superficial and deep epigastric veins; and secondly, deep or superficial infection of the abdominal incision, which is carried by the epigastric veins to the iliac and femoral veins, forming respectively a retrogressive or a metastatic thrombus.

From a consideration of the clinical symptoms these two theories are wholly tenable. The condition arises usually from 7 to 21 days after operation, giving time, in either event, for the slow retrograde formation of a thrombus, or a metastasis from the disintegration of an infected clot. It is evident that a certain amount of thrombosis occurs behind every vein that is ligated. It is then quite conceivable that in certain individuals when the chemical or cellular constituents of the blood have been altered by disease, the coagulability increased, with the vascular disturbances due to anesthesia, and the blood changes due to the ether intoxication, there may be fertile fields for thrombus formation, either from trauma or infection.

The preponderance of thrombosis in the left femoral vein is difficult of explanation, particularly when it follows an appendicectomy or cholecystectomy. It can be accounted for by metastasis as when the infection introduced in a dissecting room puncture of the index finger is followed by a thrombo-phlebitis of the left femoral vein. (Chaicot)¹². Such "leaps" must be accounted for by bacterial colonies filtering through the pulmonary plexuses and gaining the arterial circulation until they find their way to a traumatized or diseased vein wall. It is possible, of course, that a thrombosis in the epigastric veins through their anastomoses might lead to the formation of a retrograde thrombus in the left femoral.

It is needless to consider the familiar symptomatology, but based upon the etiology just discussed, we may perhaps gather clearer and saner methods of prophylaxis, for thrombo-phlebitis is indeed occasionally of serious import when metastatic emboli give rise to pleuritis, pneumonia, cerebral apoplexy, and to pyelophlebitis—all, of ominous, if not fatal, consequence.

Improved aseptic technic, with an absence of wound infection and stitch abscesses, will eliminate one evidently material factor in causation. In the ligation of veins, long dead spaces within the vessel should be avoided by clamping and

tying as distal as operative wound as possible.

Subjects with flabby skin and musculature, and with poor heat conductivity, whenever possible, receive preliminary treatment by massage, hydrotherapy and fumes. The prolonged use of retractors, particularly the self-retaining varieties, should be avoided, for undoubtedly a considerable amount of traumatism to the vein walls is caused by prolonged and high retraction. It is likewise probable that needless sponging and wiping of the cut tissues adds to this traumatism.

In my last series of 200 cellulite cases I have had three cases of thrombophlebitis, all of the left femoral.

CASE I. Female, age 28. Large uterine fibroid. No history of intermenstrual bleeding, slight menorrhagia, no anemia, general health good. Operation time 42 minutes. Subtotal hysteromyectomy, primary healing, no fever after third day. There was, however, unusual tenderness over the abdominal wall though without fever. Undoubtedly at this time the left deep epigastric vein was thrombosed and painful, this finally reaching the femoral and on the 8th day pain appeared in the left popliteal space, with chill and fever. The femoral vein became tender and whip-like. Bed convalescence lengthened five weeks. Some edema persisted for several months. This was undoubtedly a retrograde thrombus of low grade infection.

CASE II. Female, age 22. Bilateral salpingectomy and appendectomy, no drainage. Hemoglobin 80 per cent. No fever after 5th day, but complained of tender abdomen. Stitches removed on 9th day, primary healing. On 13th day temperature rose to 103°, with stiffness and pain in left leg. This rapidly became severe and was constantly painful. Fever continued for five days. Bed convalescence extended four weeks. Complete restoration in four months. This was probably another subclavian retrograde thrombus from deep epigastric veins.

CASE III. Female, age 42. Right salpingectomy and appendectomy. Massive uterine fibroid, enlarged by recent childbirth. Operation time 18 minutes, no retractors used. No postoperative fever. Stitches removed 8th day, primary healing. On 15th day pain in left calf and thigh, with limb, moderate edema, and tenderness. Bed convalescence subsided in three weeks. This was one of the puzzling cases although undoubtedly a metastatic right femoral thrombus, which occurred without obvious retrograde phlebitis.

The postoperative management of the patient may influence the occurrence of thrombosis.

Early and deep breathing exercises should be secured whenever possible, for the presence of a heavily loaded sigmoidum in the abdomen might easily slow the venous current sufficiently to aid thrombosis. There is some doubt as to the

degree to which it is wise to side to side, and then to the abdomen, thereby loosening venous stasis in the extremities.

It has been pointed out that attempts to st celotomies to give a large rectal catheter, or salt solution on the table, and to apply eight ounces every three or four minutes of distilled water can be freely tolerated, but that even in this way the fluids of the body are constantly rector of through the pelvic plexuses and kept from stagnating. The free postoperative administration of morphine, which was formerly quite general, no doubt added other factors in thrombus formation.

The preventive treatment may be summed up in strict aspects, and the avoidance of trauma. However, there will still remain a few cases due to obscure constitutional dyscrasias and invulnerable endogenous infection against which we have at present no available means of prophylaxis. It is quite possible that at some future day metastatic infection may be demonstrated as arising from the mouth, lungs, kidneys and intestines.

Surgical intervention, except in acute septic thrombophlebitis, usually of puerperal origin, is in most cases contraindicated. The brilliant achievements in the puerperal varieties form another chapter, but in passing we may pay tribute to the pioneer work of Trendelenburg, Trendelenburg, Williams, Jen Miller and others.

In conclusion, let me say, that when the problems of postoperative adhesions and thrombophlebitis have been solved, surgery will have moved triumphantly into its own.

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THE ETIOLOGY, PATHOLOGY AND TREATMENT OF PHLEBITIS.

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Phlebitis is defined as inflammation of the vein. Therefore in studying this pathological condition we must consider two things; namely the structure of the tissue in its normal attitude, and how the various forms of inflammation affect this structure. Before the subject can be properly covered we must review the anatomy, histology, and physiology of veins in general.

ANATOMY.

Veins are vessels which serve to return the blood from the capillaries of the various parts of the body to the heart. Two distinct sets of vessels make up the venous system; namely the pulmonary, and the systemic.

The pulmonary veins are concerned in the circulation of the lungs. Unlike all other veins these contain arterial blood on its way from the lungs to the left auricle of the heart.

The systemic veins are the ones concerned in the general circulation and convey the blood from different parts of the body to the right auricle of the heart.

The portal vein is a large appendage to the systemic circulation which collects the venous blood from the digestive organs. It is formed by the union of the superior mesenteric, splenic, inferior mesenteric and gastric, the *venae portae*. This vein ramifies through the liver tissue, reappears as the hepatic and empties this blood into the inferior vena cava.

Nearly all veins have valves arranged singly, in pairs, or groups of three at variable distances. This is especially true of veins of the lower extremities, where the valves are more numerous in order to support the flow against the weight of the column of blood itself.

Here and there we find veins minus these blood-column-supporting valves, as in the smaller venous canals.

The spermatic veins have only a few valves, and they are entirely wanting in the *venae cavae*, hepatic veins, portal vein, renal, uterine and ovarian veins.

The structure of the tissue through which veins pass has much influence upon the power of the vein to carry a column of blood. Such support for the veins has little fat and loose connective tissue while, on the other hand, the firm elastic tissue and muscle aid the movement of the blood.

HISTOLOGY.

Veins are composed of three coats, internal, middle, and external. The internal coat is made of endothelium, the middle coat of muscular tissue, and the external of connective or areolar tissue. The amount of these various tissues differs in veins of modified size and position. In this connection we must remember that veins are passive channels of circulation, and for this reason the muscular coat is not heavy.

The endothelium of the intima is oval in form, supported upon a connective tissue layer, consisting of a delicate network of branched cells covered by a layer of longitudinal elastic fibers only occasionally fenestrated.

The middle coat, or media, is composed of a thick layer of connective tissue with elastic fibers, interrupted by a transverse layer of muscular fibers of which the white element is generally in excess. The outer coat or adventitia is made up of areolar tissue with longitudinal elastic fibers, which in the larger veins is from two to five times thicker than the media. The muscular coat or media is wanting in such veins as the maternal part of the placenta, in the venous sinuses of the brain, veins of the retina, and the cancellous structures of bones.

The valves of the veins are formed by a reduplication of the intima, strengthened by connective tissue and elastic fibers, both surfaces being covered with endothelium. On the surface next to the wall of the vein, these cells are arranged transversely while on the surface over which the blood current flows, they are placed vertically following the direction of the current, and are of semi-lunar form. The concave margin of these valves is free and they lie close to the venous wall when the current flows normally. When there is an impediment in the onward flow, however, these edges flare and open to support the blood column.

PHYSIOLOGY.

So far as a vasomotor nerve supply is concerned we find that the veins as a whole are lacking in this innervation. However there are exceptions to this statement and it has been clearly proven by Mall that the portal vein is so supplied from the splanchnic fibers. But as far as the liver itself is concerned, the portal vein in reality plays the part of an artery and this may be the reason for Nature's variation here. It has also been shown by Roy and Sherrington that vasomotor nerves supply the large veins of the neck. Other exceptional and localized nerve supply to veins has been partly shown by others, as Thompson and Bancroft.

Pulsation in veins is not normal, as the transmis-

sion of force in the blood column is usually lost in the pre-capillary channels. However, arterial dilatation may transmit by increased blood pressure (arterial) a pulse wave to some veins. The term venous pulse should apply to a different phenomenon, namely, that seen in the jugular vein. This is due to back pressure from the heart, of which close approximation is the cause. When the flow through the right heart is impeded we observe such a pulse wave as Mackenzie has outlined very carefully.

On the whole, venous physiology is a wide field for investigation and proof. We do know, however, that veins carry impure blood to areas where it may become oxygenated and returned to the arteries for distribution.



Fig. 1. Case after peritonitis. A. V. thrombosis. Leg not used. Arrows point to swelling and discoloration. Note the smoothness of the skin.

ETIOLOGY.

The following is the result of personal observation in fifty carefully studied cases. In each case full histories were obtained as to social data, family history, past history, including past illnesses and present illness, and general physical condition.

The etiology of phlebitis, so far as any one definite organ is concerned, cannot be plausibly given in any narrow sense of the word. Under a general heading the fifty cases herein reported show that two general etiological factors come strongly to the front: first, acute infection of the intima following a localized infection distant from the vein or veins involved; and second, a degeneration, not infective in origin but rather the result of occupation, malformation, lack of structural support or deviation in line, with a final result showing some form of de-

generation beginning in the intima and extending to the other coats of the vessel. This latter form may involve only the inner coat of the vein or, if of long standing, the other two coats may become partially or completely involved. The result of the observation of these fifty complicated cases would lead us to believe that we can most readily classify our phlebitis cases into the acute, subacute and chronic types.

Forty of these cases showed that proper living, good wholesome food, care of the skin by regular bathing, and freedom from alcohol were things lacking. These forty cases were from the slums and the patients knew little of the happiness derived from right living. Thirty of these forty patients, or 75%, were alcoholics to a greater or less de-



Fig. 2. Chronic phlebitis. A. V. thrombosis. Patient in bed.

gree, twenty, or 66.6% of these thirty cases were regular toppers, indulging principally in beer, gin, ale and whiskey, but seldom to the point of intoxication. Of these thirty cases with alcoholic taint twenty-three, or 76.6%, were men, while the remaining seven, or 23.3%, were women. All of the men belonged to the laboring class, most of them working out of doors as shoymen, teamster, furniture movers, bill distributor, etc. The remaining ten cases, non-alcoholic or doubtful in type, were made up of two female adult, three male adult, and five children under sixteen years of age. Of these children two were female, aged six and ten years, three male, aged ten, twelve and sixteen years. Each one in this class of ten cases belonged to families of high social standing and living under exceptionally good hygienic conditions. So far as

diet is concerned, this group of ten cases of high social standing showed that high living, excluding alcohol, was a prominent feature. Sweets and pastry, highly seasoned roasts, gravies rich in fat and a flour paste mixture, luncheons at frequent intervals especially in the cases of the children, were admitted to be a part of the regular diet. Two of the males in this division admitted excess in sexual gratification although gonorrhea and syphilis was denied by them all.

Tobacco was indulged in by twenty of the twenty-six males, a percentage of 76.9. Of these twenty males who used tobacco eleven both chewed and smoked (55%) while the remainder (45%) only smoked, using cigars and the pipe.

The histories of these cases show that of the entire number the following was shown to be the daily working capacity of each individual. Of the adult males, twenty-seven in all, ten worked on a scale of eight hours per day, five averaged ten hours daily, and the remaining twelve worked on a variable scale as far as hours were concerned. Of the adult females, ten were housewives and worked from early morn until late at night, averaging possibly sixteen hours per day. The remaining five were women of high social standing, not taking part in the housework to any extent, yet were up until very late at night. They would not arise early in the morning, however, and obtained all of the sleep required, and at times were inclined to remain in bed too long. The eight remaining cases were children who obtained regular sleep and recreation. Thus it is shown that 20% of the patients worked on a scale of eight hours per day; 10% worked ten hours per day; 24% labored mentally or physically until their work was finished, some extending their labors into the late hours of night; 20% were housewives and worked early and late; 10% were women who favored themselves with a bountiful amount of sleep although not at regular periods; 16% were children and averaged well so far as sleep and rest were concerned.

Upon inquiring into the past history of the varicose cases it was discovered that twenty, or 40%, had had *typhoid fever*. It was surprising to me that so large a percentage should have had this illness. That no error might have been made inquiry, for confirmation, was made the second time with the same result. I saw three of these cases during the progress of the disease and all of the confirmatory tests were positive. Of these three typhoid cases one, a female, age thirty-seven years, developed a typical phlebitis. The remaining seventeen cases revealed the fact that during their

sickness, seven of them had developed severe pain in the lower limbs, and the part became very tender, sensitive to touch or weight of bed clothing, and they told of having their limb elevated with the part wrapped in cotton or flannel and artificial heat applied. These were undoubtedly phlebitides per sequelæ to the typhoid.

Thus it is seen that eight of the twenty typhoid cases had undoubtedly developed a phlebitis of the lower limbs, the femoral or saphenous veins being the seat of infection. In the one case which I observed during the activity of the causative factor the internal or long saphenous vein of the right limb was involved. Of the seven remaining cases, three stated that the right leg was the one affected, one stated that the left lower limb was involved and the



Fig. 3. Marked varicosity of lower limb in woman of advanced years. Note the tortuous course of the venous channels.

remaining three cases could not recall the precise location stating only that it was in one of the legs.

By these figures it is seen that of the eight cases having typhoid fever as a causative factor, four (50%) had the veins of the lower right limb involved, one (12.5%) had the left lower extremity involved, the remaining number undetermined as to which limb suffered the sequela. Taking the cases as a whole eight (16%) showed that the bacillus typhosus was the organismal causative factor. Osler states that three to four per cent. of typhoid cases develop phlebitis as a sequela.

One of the patients in this series gave a history of having had *pneumonia* ten years previous. He stated that during the progress of the disease he developed great pain in the left leg. At this time he was told that he had inflammation of the veins in

the affected part. Thus pneumonia may be an etiological factor in phlebitis. It seems doubtful however, that 2% of a larger series of pneumonia cases would show this sequela.

Ten of the fifty cases in this series had a *rheumatic tendency* shown either by actual joint involvement, follicular tonsilitis, pleurisy, or excess of uric acid in the urine. Of these ten cases four had had phlebitis of the lower extremity and one of the right arm and forearm.

That uric acid excess and deposit had some influence in bringing about this condition could not be questioned. Eight of the ten cases gave a history of having had fever during the rheumatic attack. The five phlebitis cases were in the list that ran a fever. Fifty per cent. of the rheumatic cases in this series showed phlebitis, while twenty per cent. of the whole series of cases showed rheumatism.

It is interesting to note that eight of the ten rheumatic cases had fever and that all of the phlebitis cases were in this group. This might be corroborative evidence to bear out the infective origin of rheumatism, so putting it into the group of bacterial diseases. While this is far too small a number to pass accurate judgment upon, it would go to show what might be expected as an etiological factor in rheumatics.

None of the cases in this series showed any signs of active tuberculosis. A few, the number being five, gave a sparse family taint. On the whole, however, this disease did not play an important rôle in any way whatsoever.

Scarlet fever contributed two of the cases in this series. One, twelve years of age, was convalescing very satisfactorily, having nearly completed desquamation, when he suddenly developed severe pain in the abdomen and the temperature rose to 103.5°. This abdominal pain was not localized at any time and was not accompanied by tympanites. The predominating signs and symptoms were continuous pain, all over the abdomen, muscular rigidity pronounced, thighs continually flexed upon trunk, and continued high temperature. The first thought was that we had a case of fulminating appendicitis superimposed by perforation and the consequent peritonitis and abscess formation. However, consultation advised watching because the trouble was not localized, tympany was absent, the bowels moved regularly without aid and the patient did not seem extremely sick. The differential diagnosis was most interesting and could be made only by very careful exclusion of other conditions. After much conservative thought the case was decided as one of phlebitis of the portal system of veins, prin-

cipally of the inferior mesenteric, hepatic and splenic involvement, situated in the tributaries. I could find no report of this condition recorded yet it was without doubt as diagnosed. The case was prolonged and the temperature continued elevated for ten days, but finally the patient recovered fully and complete recovery. I feel sure that this case will appeal as most interesting to any who are studying such a condition. The other case in which phlebitis complicating scarlet fever, developed it in the right forearm. The condition never became serious or systemic and the patient made a good recovery.

Of all of the fifty cases twenty three had had scarlet fever. This would give a percentage of 86 of scarlet fever cases developing phlebitis. This would undoubtedly be high when considering phle-



Fig. 1. Phlebitis of the portal system of veins, complicating scarlet fever.

bitis as a result of scarlet fever alone. The series would allow that 4 per cent. of phlebitis cases were a result of scarlet fever.

Septicemia and *P. Oria* were a predominating factor in this series of cases. Fifteen had at some time in life developed septicemia. Hands, forearms, mind also cases of phlebitis of the lower extremities, and two, bowed in, were also phlebitis, thickened veins with ulceration of the intima and, in one case, a thrombosis of a vein. Although the etiology was not uniform yet I can hardly do otherwise than believe that the cases of septicemia are extremely common phlebitis, an accessory or complicating factor. One of these fifteen cases showed enlarged veins, engorgement about the area of inflammation. I believe that the

phlebitis begins as an intrinsic factor before the intima becomes involved. In other words it appears to be a local condition as a result of continuity rather than a metastatic one until in the later stages.

This series gives septicemia as a cause in 30% of phlebitis cases. I believe that this percentage is none too high. In fact, wherever septicemia or pyemia result fatally I believe that venous involvement could be demonstrated in every case at necropsy where the condition had existed for more than three days. Osler mentions that arterio-sclerosis is a most common terminal condition of septicemia. Is it easy to believe that channels running in such close approximation would escape the association of evils? Another argument in its favor is the very frequent cardiac involvement following septicemia, demonstrated as pericarditis or endocarditis. John W. H. Eyre himself brings forward the frequent occurrence of septicemia. Keen also describes phlebitis resulting from septicemia and terms this condition septic, non-pyogenic phlebitis.

Thus it is seen that what the laity know as "blood poisoning," is the cause of phlebitis in one form or another in nearly one-third of all the cases. In this series ten were male and five female.

Malarial fever was found in one of the cases. It was the intermittent type and occurred in a male, age forty-five. This patient had the general cachectic appearance, and the parasite was demonstrated in the blood current. Occasionally he would develop a marked tenderness in the lower limbs or now and then in the forearm. At such time the part involved would be swollen, red and hot, pain being very much in evidence and continued in character. These attacks of extremity involvement would always accompany the activity of the disease and would subside with it.

While I realize that a long series of malarial patients might not show phlebitis as a complication, yet I feel it proper to include this case in the percentage etiological list. It gives malaria as a two per cent. cause.

Syphilis played a somewhat important part in this series of cases. Ten of the patients had had this disease; seven had acquired it and three had inherited it. Three of these cases showed acute symptoms in the form of redness, swelling, heat and pain in one of the lower limbs. The remaining seven cases showed themselves in the form of varicosity of the veins or phlebectasis. Three of these instances of varicosity occurred in the abdominal wall, the remaining four cases having the lower limbs involved. In some of the later cases the phlebectasis extended up to and upon the inner as-

pect of the thigh. A peculiar fact exists in that everyone of the syphilitic cases showed signs of phlebitis in some form.

I believe that this disease stands out as a much more important etiological factor than would at first be considered. Although in none of these luetic cases could the venous involvement be directly attributed to the disease, no other cause could be found. It is fairly safe to assume that this trouble was the result of specific infection.

Many conditions have been laid at the door of syphilis because of lack of proper backing in looking for some other etiological factor. It is felt, however, that if every syphilitic case could be taken to the post-mortem table, few would pass as not having venous involvement in some part of the system.

Any number of cases might have venous involvement the result of an acute condition elsewhere, yet in each case I believe that syphilis would play its part in another area of the venous circulation. In the future of syphilis, its affection of the veins may be prevented, by the early use of salvarsan, from going further than superficial lesions. But only time, careful observation and the compilation of proper statistics will reveal the truth of this hypothesis. Be that as it may, syphilis has certainly stood out in the past as a most important factor with an end-result shown by its action on the venous circulatory channels. These series would go to show that twenty per cent. of all phlebitis cases could be traced directly or indirectly to specific origin.

The *puerperal state* is another condition to be considered in looking for a causative factor in phlebitis. During pregnancy the ovarian and uterine veins become greatly distended and thus might be regarded as undergoing a physiological, temporary, hyperplastic phlebitis. As time goes on and delivery has taken place these veins are left filled with blood, the column being poorly supported both within and without. What a fruitful field for trouble, if the least bit aggravated! Such an aggravation does occur now and then resulting in a very grave condition. Following all deliveries there is a rise in temperature whether or not any degree of infection has taken place. Where this fever comes from is perplexing at times. After careful consideration we cannot but assume that absorption or auto-intoxication must play its part, when signs of infection are absent.

Of the fifteen female adults in this series, three cases showed the following symptoms and signs always within forty-eight hours after delivery (the

time alone eliminating the probability of sepsis as the causative factor). Each one of these cases began by complaining of acute, intermittent abdominal pain. Intestinal gas as a cause was eliminated. This painful condition would soon be supplemented by a more or less sudden rise in temperature to 102° or 103°. The bowels would be slightly constipated and no other special signs or symptoms would develop. The patient would seem extremely sick, however, yet lactation had begun normally.

One of these cases comes up very emphatically to my mind. This was the case of a woman who had moved to New England from Pennsylvania. At the time of transportation she was seven and one-half months pregnant. Upon arriving at her new home she began to work with much vigor. Stretching, stooping, etc., soon told on her, and she

soon became ill. Her pregnancy, it could be of no doubt, was healthy but the condition here very followed the case of the child in utero aborted.

Mechanical causes and chronic phlebitis will conclude the etiology of the cases in this paper. Keen has so well outlined the general importance of these matters that but brief mention will be made of them. The form of phlebitis from mechanical influences is one that is included in two of the three, or as secondary to any particular disease. In other words, we have a condition consisting of a form of radiase veins. This is, however, a true phlebitis of a chronic type due to three factors: lack of proper column support through absence of valves; a granular or fatty degeneration resulting from overweight or overtaxing of the muscular system; continued over-distension where valves are plentiful and fatty or granular changes in and about the vessel walls are absent, yet atrophy of the fibrous elastic tissue results. This in reality is an asthmatic condition of the venous channels.

Eleven of these cases were seen, five in female adults and six in male adults. Of these eleven cases, seven had the condition very marked in the lower extremities, two had the veins of the abdo-



Fig. 3. Varicose ulcer of lower calf. Note the ulcerated skin area.

men involved, the remaining two had the condition commonly known as varicocele.

Of the seven leg cases, four were in females and three in males. Each one of the women had delivered two or more children and could trace the beginning of the condition from this. The three males were robust, two being motion men on street car lines, while the other was a janitor and elevator man. The two abdominal wall cases were in females and laid their trouble at the door of pregnancy, one having delivered three children and the other six. Each had a very marked relaxation of abdominal wall and the veins could be very readily emptied by upward pressure or collapse motion.

The two varicocele cases had been troubled with the condition for years. One had been a professional bicycle rider in earlier life, the other had had on his tail, with a long interval, following gonorrhea.

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It is seen that 22 cases out of the phlebitis cases in this series were under treatment. I believe that this percentage is very reliable. This, therefore, a strong form of evidence being presented. In fact from a casual point of view the cases require quite a small attention to do the acute type. They are

The remaining two cases in this class were recorded as the previous case. One died, the other recovering after a very much lengthened convalescence. The mortality of this class of case in this series is 66.7%, a very high mortality, yet such as is generally conceded from the reports in our general literature. This series of cases would show that 6 per cent. of phlebitis cases were of the broad

and the Jacksonian type of epilepsy. In the latter there is usually a definite aura; whereas, almost invariably in the former a sharp cry precedes the convulsion.

In essential or general epilepsy the muscular contractions are at first tonic but later become clonic, the entire body being involved; whereas, in the traumatic or Jacksonian type only a portion of the body participates. Based upon these obvious clinical facts some observers (particularly neurologists) have designated as "epileptoid" all types not truly essential in character, *i. e.*, the cases in which possible causative factors, such as trauma, encephalitis, etc., can be demonstrated, are not recognized as true epilepsy.

Since operative surgery has resulted in the discovery of causative cerebral lesions in such a large percentage of cases, and since pathologists have demonstrated the almost constant presence of degenerative changes in the giant pyramidal cells of Betz (found only in the precentral convolution), even where a deeper growth or other gross lesion may have constituted the primary causative factor, the hypothesis has been markedly emphasized that even so-called idiopathic epilepsy is dependent upon traumatic or other recognizable (although possibly undiscoverable) causes.

In the surgical treatment of epilepsy, while neither the Kocher valve operation nor the excision method originally suggested by Horsley offers a large percentage of complete cures, if a limited number of these unfortunate patients can be permanently relieved and others distinctly benefited by the invocation of surgery, are we not amply justified in giving them the opportunity of possible benefit? And, granting this premise, is it unreasonable to hope the opportunity thus afforded for study of the brain on the operating table may reveal pathology which is not terminal, and open avenues of increased promise of relief to individuals hitherto utterly and hopelessly condemned as beyond assistance? As a rule the epileptic ends his days most miserably, his life is a distress and a reproach, and not infrequently existence is terminated by suicide, when, except for this affliction, the individual might be a useful member of society.

While in epilepsy of the Jacksonian type complete and permanent relief by surgical intervention cannot be promised in any individual case, the outlook for betterment is so much more favorable than in the essential variety that the surgeon is justified in advising his patient to submit to operation. This type of epilepsy can usually be recognized by the aura which always precedes the convulsion, and by

the regular manner or progressive sequence in which muscle group involvement occurs. These phenomena, however, must not be confused with the status hemi-epilepticus which sometimes accompanies idiopathic epilepsy. The seizure always begins in the same muscle group, progressing to other centers on that side, then crosses and involves the opposite side in regular sequence.

If one exclude the cases presumably owing their origin to so-called reflex causes, such as adherent prepuce, eye strain, etc., it will be found that in all others there exist definite changes in the cerebral cells. These changes may only be demonstrable microscopically in the giant cells of Betz, or there may be merely cell degeneration due to toxicity, as from alcohol, lead poisoning, etc. The anamnesis may have to be extended backward to the date of birth; trauma from delivery forceps may have eventuated in fracture or intra-cranial hemorrhage; later cerebral injury may have been inflicted by a blow, a stone, or a fall. Operation may reveal adhesions between the dura and an old fracture line, or exostoses may be found present; there may be scar tissue within the dura, or if subdural hemorrhage occurred a cyst may be found. Again, there may be a history of encephalitis, or of cerebral symptoms following some of the infectious diseases. The presence in the calvarium of neoplasms, abscesses, or hydrocephalus, may cause epilepsy of the Jacksonian or even the essential type, from pressure because of lessened intra-cranial capacity. Therefore, all cases must be carefully studied as to type, and more particularly as to cause.

As already intimated, in the Jacksonian variety of epilepsy, surgery offers the patient some hope of relief, and as in other surgical affections the earlier the operation is undertaken the greater the possibility of lasting benefit; and, with the discovery of removable tumors, cysts, scars, etc., this is especially true, even although the presence of such lesions may have been unsuspected prior to operation. It must be borne in mind, however, that the discovery and surgical removal of a definite lesion does not always foreshadow complete cure nor even permanent improvement. Therefore, I do not wish to be understood as expressing the opinion that in all cases epilepsy can be cured by surgical intervention, nor that every patient so afflicted should be subjected to operation; but I would urge the most careful clinical investigation and study of every case, and if there exist no distinct contraindication to operation, that the patient be given the opportunity which affords a definite

epilepsy, or toward into the possibility of complete and permanent cure.

Several instances where the causative factor is one of those mentioned in the foregoing paragraph, early operative intervention is distinctly advisable.

As in other surgical diseases, delay means further myelomata, with extension of cell degeneration, increased physical and mental retardation, and lesser possibilities of permanent benefit from any method of treatment.

My preference in the surgical treatment of epilepsy is the plan suggested by Horsley, viz., excision of the so-called epileptic area in the cerebral cortex. Based upon his extensive clinical results in Jacksonian epilepsy, Krause insists that, even though there be no story of trauma and negligence noted in the history, nevertheless, the area in the precentral convolution in which the attacks begin should always be excised. In connection with the performance of this operation, however, a few points of warning should be mentioned. It is of the utmost importance that asepsis be irrefragable, as the slightest infection may result most disastrously. Haste has no place in cerebral surgery, and haste should not be attempted at any stage. It is advisable, therefore, to perform the operation in two stages, i. e., carefully lifting the bone flap at the first session, and postponing dural incision, excision, and closure of the craniotomy until a few days. Nothing can be lost by reversing this plan, and the life of the patient may be gained.

In searching for the area epileptic, it is best to use stimulation by means of a battery, using large pad as one pole over the table electrode. The battery and electrode being made for this purpose were made by Meigs of Chicago, Ill. The battery is so regulated that a constant current may be reduced for stimulating the cortex only the weakest current is permissible. It has been tested by the surgeon, and the electrode should march in part the motor side of the cortex. After being tested, the electrode is changed to one on the similar in size and shape which has been sterilized. Stimulation must not be too far beyond, nor too often repeated, otherwise the cortex may be exhausted or the stimulation may produce a grand epileptic seizure resulting in death of the patient upon the table.

The administration of bromide, as a sedative, continued for several lengths of time, after operation, is necessary to insure the best results. The majority of cases, however, will be benefited. In but few instances will the attack be so violent

that the patient may come to a complete cure. In such cases, however, the patient may be cured.

It should be remembered that the patient should be kept in a hospital for a period of at least six months after the operation.

The following is a list of the cases which have been treated by the method described above.

Case 1. A female, aged 21 years, who had been suffering from epilepsy for several years.

Case 2. A male, aged 22 years, who had been suffering from epilepsy for several years.

Case 3. A female, aged 23 years, who had been suffering from epilepsy for several years.

Case 4. A male, aged 24 years, who had been suffering from epilepsy for several years.

Case 5. A female, aged 25 years, who had been suffering from epilepsy for several years.

Case 6. A male, aged 26 years, who had been suffering from epilepsy for several years.

Case 7. A female, aged 27 years, who had been suffering from epilepsy for several years.

Case 8. A male, aged 28 years, who had been suffering from epilepsy for several years.

Case 9. A female, aged 29 years, who had been suffering from epilepsy for several years.

Case 10. A male, aged 30 years, who had been suffering from epilepsy for several years.

Case 11. A female, aged 31 years, who had been suffering from epilepsy for several years.

Case 12. A male, aged 32 years, who had been suffering from epilepsy for several years.

Case 13. A female, aged 33 years, who had been suffering from epilepsy for several years.

Case 14. A male, aged 34 years, who had been suffering from epilepsy for several years.

Case 15. A female, aged 35 years, who had been suffering from epilepsy for several years.

Case 16. A male, aged 36 years, who had been suffering from epilepsy for several years.

Case 17. A female, aged 37 years, who had been suffering from epilepsy for several years.

Case 18. A male, aged 38 years, who had been suffering from epilepsy for several years.

Case 19. A female, aged 39 years, who had been suffering from epilepsy for several years.

Case 20. A male, aged 40 years, who had been suffering from epilepsy for several years.

Case 21. A female, aged 41 years, who had been suffering from epilepsy for several years.

Case 22. A male, aged 42 years, who had been suffering from epilepsy for several years.

Case 23. A female, aged 43 years, who had been suffering from epilepsy for several years.

epileptic attacks occurred in 1910, which he says were preceded by "a feeling of dizziness or swimming in his head." Even after severe seizures supervened there were no distinct prodromal symptoms until December, 1911. Since then he says the attacks begin by his "seeing people or animals—tigers, elephants, lions, foxes—coming after him to catch him and rut him." Just as he is caught by one of the animals (the lion most frequently) everything becomes blank. He does not know when nor where the convulsive movements begin, but has been told the movements are first noted in the left arm. Following an attack he is drowsy and weak for five to ten minutes, but after walking around a little that he feels better. He says he has never bitten his tongue nor given a "cry" at the beginning of a seizure, nor was either noted while he was in the hospital. There is no especial weakness in any limb following a convulsion—all being extremely weak.

During the first year (his 11th year) three to four seizures occurred daily, and during his 12th year about the same conditions prevailed. From the age of 13½ years to the present time he has had two or three attacks per day three or four days each week. He says the seizures appear less severe than previously, and he feels less exhausted thereafter; duration of each attack one to three minutes. Although his appetite has been fairly good, since May, 1912, he has lost 22 pounds in weight. The bowel function is regular, and urination normal, i. e., five or six times in twenty-four hours. Pressure at junction of the parietal and occipital bones causes slight pain above both eyes.

October 20th, 1912: Slight epileptic attack; unconsciousness; clonic convulsions involving muscles left side of face and left arm; mouth drawn to left more than the right; attack not seen by nurse. The mother says she has never witnessed the beginning of a severe convulsion, that in slight attacks "the left side seems to draw up, the body being bent over to left side," but the duration is so brief that she has never noticed particulars. Patient has been taking bromides three years without improvement. Urinalysis shows urine normal, and blood examination reveals nothing abnormal.

Operation, October 28th, 1912. Osteoplastic flap as preliminary stage of excision operation. On right side of skull over motor area there was made an osteoplastic flap, six openings bounding a quadrilateral area being drilled with Hudson's instrument. The two openings at summit of flap were connected with Gigli saw, the lateral openings by means of Dalgren's forceps, and the base of the flap then fractured. The dura pulsated and seemed to be under increased tension. The osteoplastic flap was replaced, and the skin incision sutured with No. 1 plain and chromic catgut.

On November 18th the second operation was undertaken, consisting in excising the motor area of left arm in which the spasms invariably began. The osteoplastic flap was quickly elevated, the dura incised along each side and at the base of the cranial opening, and the dural flap turned upward. Condition found: Edema of arachnoid (moderate). The veins appeared larger than normal, and along

their course white bands of fibrous tissue were noted. The capillaries were especially prominent. Punctures were made in the arachnoid, and a considerable quantity of fluid was evacuated. Mild faradic stimulation of precentral convolution was then practiced, the focal areas of shoulder, arm, fingers, extension of hand, leg and foot, and part of face centers, being definitely located. The motor area of the arm center was excised 6 m.m. deep. The dura was then sutured and the flap replaced. The skin wound was closed with catgut and a dry dressing applied. Hemorrhage from the scalp incision was effectually controlled by an encircling buttonhole or lock-stitch, similar to Heidenhain's hemostatic stitch which is sometimes employed for this purpose. The surgical steps were executed under light chloroform anesthesia.

On November 22nd there was slight paresis of the extensors of the left hand, and typical wrist-drop on left side; flexion of fingers about normal, that of arm weak. From this time the return of function in the left arm and hand, which had been almost lost following the operation, was exceedingly rapid. For several days after excision of the brain substance there was no recurrence of the epileptic seizures, but ten days later they reappeared notwithstanding the administration of bromides was commenced five or six days after the operation. The latter part of January, or two months subsequent to operation, the administration of ergot and digitalis was begun, and in February the patient had his last convulsion. All medication was discontinued the last of April, and to date (November 20, 1913), he has had no further convulsions.

The foregoing case is not reported as a permanent cure, since it is well recognized that even without treatment an epileptic may enjoy freedom from attacks for six months or a year, and then have a recrudescence. However, it is believed that the history of the patient and details of the operative steps undertaken for his relief possess sufficient interest to warrant this preliminary report.

The difference in the physical appearance of the patient since the operation is most marked. When admitted to the hospital in October, 1912, he weighed only 86 pounds, whereas his present weight is 135 pounds. The greatest improvement, however, has been in his mental condition. When first observed he was a drooling, bromide-saturated, unintelligent looking boy who could not even answer questions; he was completely incapacitated and unable to take care of himself. Today he is a happy, rosy-cheeked, handsome lad, with a bright expression, intelligent and prompt in replying to questions, doing a man's work every day, not only earning his own livelihood but assisting his family.

In conclusion: I cannot refrain from expressing my firm conviction that the wonderful improvement which has been effected in the mental and physical

condition of the patient is principally attributable to the rational application of modern surgical methods, and it is to be hoped that the benefit already derived may not only continue but prove to be permanent.

If such brilliant results can be obtained in only one out of five or even ten cases of this character, certainly greater benefit will have accrued from surgery than we could hope to secure by the administration of drugs; and are we not, therefore, justified in recommending that these unfortunate patients grasp the opportunity of relief which is afforded by surgical intervention? If a few patients can be permanently cured by operation, and the condition of a larger number improved, who will deny them the beneficence of surgery?

A NOTE ON THE MANAGEMENT OF BURNS.*

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There are four things to take into consideration in treating burns, any one or all of which come up in a given case:

First—To combat the shock, if it exists.

Second—To relieve the pain and nervous excitability.

Third—To prevent infection and protect the exposed living tissue.

Fourth—To help Nature in her work of repair.

(1) Shock, which often occurs as a result of severe burns, is treated on general principles too well known to be discussed in this paper. It has been said that "shock is shock," meaning that, regardless of its cause, shock must be treated in the same manner under all conditions.

(2) To relieve pain and nervous excitability I think it best to give a hypodermic injection of morphine and atropine. The size of dose varies according to the age of the patient and the severity of the case. Then immerse the burned area, if it be an extremity, in cold water to which has been added either a teaspoonful of bicarbonate of soda or common salt to a quart of water. A temperature of about 50° or 60° F. is preferable. If the burned area, on account of its location, cannot be immersed in water, it may be covered with a hot smooth cloth which has been dipped in the solution, then by gently and continuously applying the solution to this cloth the same result will be obtained. This water bath may be continued for one hour, or until the system is affected by the morphine injected.

Tested, liniment, etc. trained assistants are always at hand, and the bath may be used and continued for days on a large area of the surface of the body if desired.

3 and 4. Protection of the tissue, and prevention of infection demand our greatest efforts and must be kept in mind from the first. Nature puts forth her greatest efforts, and the system will exhaust its entire resources to accomplish the end; but Nature cannot prevent the invasion of putrefying micro-organisms. The surgeon may.

I wish to condemn two things often done that are sanctioned by most of our text books. First, the puncturing of blisters immediately after a burn; and, second, the use of cotton oil and other remedies of this kind as a protecting dressing. A blister is a non-irritating protection to the delicate underlying tissues, and we can furnish none better. I have never known the raised epidermis to reunite with its base after the blister was punctured. In most cases it acts as an irritant, and for several days following it causes serum to be poured out under the dressings, to soil them and furnish a good culture for any possible pus-producing germ that may be waiting for a chance to assert itself. Within a few days the epithelial cells in the deep glands of the skin will have accomplished their work of repair if properly protected by the blister. If any blisters are accidentally burst, with the epidermis rolled up or displaced to any extent, it is better to remove such epidermis at once.

I consider the following line of treatment the best for preventing infection and protecting the tissues. After the patient is fairly comfortable the bath may be discontinued and the burned area with the surrounding surface sprayed or mopped with hydrogen peroxide. The entire surface should then be mopped with dry gauze. Then apply strips of gauze which have been previously soaked in a 2 per cent. solution of picric acid in dilute alcohol. Over this apply a thin layer of cotton and hold in place with adhesive strips or a roller bandage. This dressing may remain until it is soiled, at which time remove all soiled or wet dressings, clean with hydrogen peroxide, mop dry, and re-apply fresh gauze soaked in the picric acid solution. About the third day open all blisters and re-apply with fluid cotton, applying a fresh dressing at once.

I think that this is the best treatment for all burns, whose severity is not great enough to cause sloughing. If sloughing does occur as a result of charred tissue, or fever, a result of infection, the dead tissue should be removed surgically, as it becomes loosened. Then the dressing is changed and

*Read at the 2nd Annual Meeting, held in New York and New England Association, at Pawtucket, N. J.

face is cleaned with hydrogen peroxide, dried, and mopped with the picric acid solution. Over this put strips of rubber tissue that have been kept in a bichloride of mercury solution, 1 to 1000. Then apply the picric acid compresses and cotton as before. The astringent action of the picric acid limits the exudation of serum by constricting the congested superficial capillaries, and does not interfere with the development of the new epithelium. Its antiseptic action prevents infection, and I have never seen any systemic toxic effect. The rubber strips furnish a non-irritating covering for the denuded surface, and do not disturb the granulations when they are removed. If the rubber tissue is applied in narrow strips and the edges permitted to overlap, the dressing will more perfectly congeal to the irregular surface. This dressing should be changed as often as is necessary to keep the surface clean and free from pus.

The treatment above outlined, allowing for modifications in each individual case, is one which I consider most nearly ideal with every degree of this most common accident, from a slight scald to that produced by the most terrific gas explosion.

THE ETIOLOGY OF DUODENAL ULCER.

I have long held the view that the diseases of the stomach, duodenum and gall-bladder, with which the surgeon deals, are not primary but secondary. They are the result, in my opinion, of an infection or of a toxemia which has its origin for the most part in some abdominal organ. The experimental work of Türk, of Wilkie and others, strongly supports this view, as does also the knowledge we have of the development of acute ulceration of the duodenum in cases of burns, uremia, pemphigus, erysipelas, operations upon the genitourinary organs, and many other intensely infective conditions. The evidence has seemed to me to be strongly in favor of supposing that the source of infection in many of the cases of chronic ulcer is in the appendix; in some it is in the small intestine, in some in the large, in some in the pelvic organs of the female, in some in parts outside the abdomen. A routine examination of the abdomen should follow the direct dealing with the stomach in all cases of duodenal ulcer, if the patient's condition permits this to be done with safety. It is remarkable with what frequency one then discovers a serious lesion in the appendix. I therefore make it a practice, with few exceptions, to examine and remove the appendix in all cases of gastric and duodenal ulcer and of gallstones.—B. G. A. MOYNIHAN, in the *Lancet*.

THE MANAGEMENT AND CARE OF THE INJURED IN LARGE WRECKS.*

F. B. WEAVER, M.D.,

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The first thought of the railroad surgeon is to reach the scene of the accident as quickly as possible. After the arrival, make general inspection of all the injured passengers and in a general way you may determine the number of passengers injured and the extent of the injuries. Temporary quarters must be provided where the more seriously injured may be taken and cared for.

Usually this is accomplished by turning into use one of the least damaged passenger cars—a sleeping car being preferred, as the berths may be used for cots—and if this car is not damaged it may be taken to its destination without the unnecessary handling of the injured, the one thing which is always to be avoided.

In the meantime a relief train has been ordered out with supplies, surgeons and nurses. Until this relief train arrives the company surgeon is caring for the most severely injured, with the help of the passengers and the trainmen who have not been injured. On the arrival of the relief train it has been my custom to direct the work of the assisting surgeons and so systematize the work that there may be no duplication of medication or unnecessary examination and handling of patients. Frequent transfers of patients from one car to another should be avoided, and when moved they should be placed in a car suitable for taking them to their destination, the company surgeon of the territory and nurses accompanying them, and when possible making sub-sequent visits.

After the relief trains arrive, and the assistant surgeons are at work, the name, home address, the destination address, number of days to remain there, and the extent of injury, if any, of each passenger should be taken. This list when completed should reach the railroad officials as quickly as possible.

In cases where the passengers are willing and the injuries will permit, the passengers should be allowed to proceed to ticket destination, and in many instances they can, from their hotel or hospital, keep their business engagements. In case of wreck of a local train I would advise those injured to be taken to the hospital, for they would be able to receive better treatment there than in their several homes.

*Read at the 22nd Annual Meeting of the New York and New England Association of Railway Surgeons.

The welfare of general and all passengers should be catered for, the uninjured as well as the injured. In cases of delay in leaving the scene of wreck, some provision should be made for meals and shelter when necessary.

The following is the report of a wreck occurring at Rhinecliff, October 17, 1909, about 4 A. M. It was a cold, cloudy morning, with heavy fog, and very damp. The wreck occurred very near the station, but, being early in the fall, the fires had not been started as yet, and the station was cold and damp. It was just the beginning of break of day. There was a pitiful sight. One passenger was killed. A Mrs. C. M. O. Albany, painfully injured, was just recovering from a long illness of nervous prostration. She decided she would rather return to her home in Albany, and on the first train north I sent her there in care of one of my assistants. Mrs. T. and her five children were not seriously injured, but she was just out of a sick bed, following a miscarriage. The shock and excitement of the accident brought on secondary hemorrhage. You can imagine the difficulty of giving her proper care under the circumstances, but fortunately there was a private car on the train and the owner very willingly allowed one section of it for her comfort, where she was made very comfortable and given good care.

Now, while the injured were being cared for, those who were not injured and those only slightly injured became very uneasy, and some very disagreeable things were said of the railroad company, etc. There was a hotel about five hundred feet from the scene of the wreck, and as soon as possible I had all who could be moved taken there, fires started, and plenty of hot coffee, tea, milk, etc., made ready, also sandwiches, eggs, etc., and all had what they wished. In an hour's time you would not have thought they were the same people. Their feelings had entirely changed. When the relief train was ready all were willing to go through to New York, and had a more brilliant attitude toward the railroad company. I went to New York with the train, and with Mr. T. and her five children to Brooklyn, where I resided until their family physician arrived. She made a rapid recovery.

March 13, 1912, was the date of the Twentieth Century wreck near Hyde Park. Forty-seven passengers were on the train, and all were more or less injured, none seriously. The ones not hurt were placed in a sleeping car and the injuries dressed until the relief train arrived, where the work was finished. They were all New York passengers and anxious to arrive there.

After discharge, all members of the crew were transferred to a rail car and transported to and taken to New York, to be cared for by the hospital. On arriving in New York, the injured were taken to and private ambulances called for to take them to and hotels, having telegrams sent to their respective train for necessary calls, etc., for their return in arrival.

MILITARY SURGERY

General M. Bacon,

Albany, N. Y.

Submitted to the Medical Association

This paper was presented at the meeting

Such patients, who do not recover within a reasonable time, say about two weeks at the field hospital, are likely to remain sick for a prolonged period and may even remain crippled for life.

All such patients are of course sent either to the evacuation hospital or the base hospital, where their conditions are treated normally, if possible, as they would be in a civilian hospital.

A discussion of the therapeutic measures to be undertaken there for the relief of chronic emphysema, pericarditis, mediastinal abscess, osteomyelitis of sternum or ribs, etc., is therefore, beyond the scope of this serial.

The difficulty of making a prognosis in cases of chest wounds is recognized by civil surgeons. But surprises await the military surgeon, especially in the first few weeks.

The following case is instructive in that respect. A Russian soldier, aged 30, was hit in the right foot at Mondrago, February 20, 1900. He remained on the field moon on injured 6 A. M. A first aid dressing was then applied.

He reached the German Red Cross Hospital February 28. At night, some what better, the second right rib a wound not larger than a pea, and, luckily, the wound not on the tubercular area, responded to the treatment of the first aid dressing. The leg in a few days began to swell, and the train to Delmonico Hospital was recommended. He was able to walk in the afternoon, but in the evening, after dinner, a coughing fit, which was followed by a severe attack of asthma, and the word of entrance was, "He has died." Some time later, the body was found.

March 21, 1912, Delmonico Hospital, New York. The patient, a Russian soldier, was brought to the hospital in the morning.

At first, slight coughing, and in the afternoon, after dinner, a severe attack of asthma, and the word of entrance

March 31. Dulness has rather increased. Patient suffers from difficulty of breathing.

April 6. Sudden rise of temperature. Air hunger. Aspiration of 69 c.c.m., serous liquid from the right pleura—sterile. The temperature curve resembles that of pneumonia. Then there are at first brief, later longer, intervals which pointed to lung abscess. Exploratory aspiration which was done repeatedly remains without result. No sputum.

April 17. Partial removal of seventh rib in anterior axillary line to enable better drainage of their suppurative effusion. No bacteria could be cultivated.

The patient loses ground and death takes place 106 days after receipt of injury (sepsis).

Necroscopy shows that the lower lobe of the right lung has a leathery consistency. In the upper lobe inflammatory foci. Middle lobe hard and free of air. No abscesses. Spleen enlarged.

The case is highly instructive. First of all the length of time between receipt of injury and death preaches a sermon not easily forgotten. Given a remission after a few weeks rise of temperature and no bacteria in the exudate, only a careful observer will be slow in giving a favorable prognosis. There is no doubt of the fact that this patient died of sepsis (enlarged spleen!). The inflammatory foci in lung tissue after gunshot injuries of the chest, unless there be a pronounced pneumonia, should awaken our earnest attention.

I quote from the records of the same institution another case emphasizing what has been said.

Soldier, shot February 18 by a small-calibre, jacketed missile. Wound of entrance anteriorly over the third right rib. Two fingers breadth from the median line, size of a large pea and round, suppurating. Wound of exit right posteriorly, four fingers breadth from the lamina, two fingers breadth below scapular angle. Soft parts around wound swollen. Weak respiratory sounds. Fever.

Fever increases, as does dulness on percussion and difficulty of breathing. Then gradual improvement subjectively and objectively. The bloody pleural effusion which seems to be the cause of all the trouble proves sterile.

March 24. For the past three weeks almost normal temperature. Suddenly rise. Dulness of right side unchanged, over it bronchial breathing, above it amphoric respiration. Eighth and ninth ribs sensitive to pressure. Liver sensitiveness to pressure striking. Aspiration again produces only sterile effusion, clear and odorless. Sputum as seen in pneumonia. The symptoms disappear gradually May 6. Evacuated by railroad.

We see that we may have sterile effusion and yet the sudden rises of temperature speak for a process in the lungs not always demonstrable either by physical examination or by the characteristic sputum, as happened in the case just cited.

Undoubtedly in many such cases the inflammatory process is central.

The experience of recent wars has also shown that several missiles may hit one or both lungs without producing correspondingly graver symptoms.

Even shrapnel bullets have failed to produce a more serious condition than jacketed missiles of smaller caliber.

With exceptions of the characters above noted modern gunshot wounds of the chest may be looked upon as comparatively benign.

XVI.

GUNSHOT WOUNDS OF THE ABDOMEN.

The triumphs of modern surgery as regards the cure of abdominal infections and lesions, the technic of what was considered in former times a *noli me tangere*, but now a comparatively simple affair—the relative safety of laparotomy under modern asepsis have stimulated the minds of great military surgeons to undertake abdominal surgery on the battlefield. Even comparatively recent writers have been very optimistic therapeutically, but the experiences in Cuba, in Africa, in Manchuria and in Thrace, all point to the need of great operative conservatism.

Indeed the pendulum has swung in the opposite direction—many are the voices raised against laparotomy at the front.

It is difficult considering the tremendous amount of clinical material on hand to settle the question of operative therapy for gunshot wounds of the abdomen with one dictum, certain prominent writers to the contrary notwithstanding.

Nevertheless definite rules can and should be formulated for our guidance in the field.

The reason for the diversity of opinion is not obscure. Cases are seen when a small caliber jacketed bullet inflicts a perforating abdominal wound. From the path of the missile perforation of the intestine certainly did take place. The stricken soldier remains on the battlefield unaided for some time. When found and taken to the field hospital an uneventful rapid recovery takes place. Why did this patient get well? Because the small wound or wounds of the partly empty intestine healed by the absolute rest of the helpless body. Nature is performing what surgeons are endeavoring to do by means of intestinal suture. Such cases surely point

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WALTER M. BRICKNER, M.D., Editor

NEW YORK, MARCH, 1914.

RADIOENTHUSIASM.

The public was too recently fooled, too bitterly deceived, by the much-advertised Friedmann "cure" for tuberculosis, to be easily led astray again by the newspaper accounts of an old-new "cure" for cancer. But its interest has been aroused and its imagination has been stirred by the marvelous healing powers of radium as daily recorded in the public press, where "emanation" is now as conspicuous as Carrie Nation once was. If all the quoted accounts and predictions were true, the young doctor who does not invest a few thousand dollars in a tube of the precious stuff will not have supplied himself with all the office furniture his calling demands.

But the blame should not be laid entirely, if at all, at the doors of the newspapers. For the most part, they but report as accurately as they can the reluctantly granted interview, and the conservative outgiving of the medical meeting. Transcending anything in the reliable dailies in reckless enthusiasm and unwarranted prediction are some of the current articles on radiotherapy in our own publications. We have in mind especially at this writing, a recent article (in one of the best medical journals), that bristles with Latin phrases and fulminating fervor. If we rightly interpret the author's sentiment he inclines strongly to the belief that for sufferers with malignant growths the blood-red sun of surgery has forever set and, already in the meridian

of their bright sky, radium is shedding its benignant rays on the constellation and tropic of cancer!

After asserting, with much truth, indeed, that carcinoma of the breast is "one of the opprobria of surgery" the following shocking utterance escapes from him:

Here is a woman looking to her friends as well as ever and able to do her work as a singer. She takes a friend into her confidence and reveals a cancer of the breast: at the urging of this friend she is operated on. The whole complexion of things is changed—no recuperation, even under the most favoring circumstances! But on the contrary, immediate prostration and a steady decline to death four months later. Certainly surgery seems an active "precipitant" in such a case. "But," rejoins Surgery, "we must get the case early." Said a surgeon dying, himself an earnest advocate of much and early operating, "I am sorry I had it done," referring to an operation in regard to which a foremost surgeon had felicitated him on its very early execution.

Surgery, which is daily saving thousands of lives, including many of those threatened by cancer, does indeed "seem an active 'precipitant'" in various cases in which the outcome is unfortunate. Assuming that the singer's breast cancer was of the most favorable type for surgical treatment; assuming that, instead of "immediate prostration and a steady decline to death four months later" (cause not stated) she had died in four days or four hours; even then, what is there in this example, and what are the accomplishments of radium in mammary carcinoma that justify the dangerous, not to say reckless, teaching conveyed by the paragraph quoted? Our author surveys the literature of recent radium results. He refers to the brilliant cures reported last summer by Bunn and Voigts, to the claims of Domenichi and of Abbe and to the striking observations of Gauss. But none of these, if our recollection serves, includes breast cancers. He dwells on the cures, by various men, of several skin affections, including epithelioma (and without at all discrediting radium it must be said that many of these cures could also be attained by x-rays and caustics). Finally, he says:

Cancer of the breast has not been radiated on a large scale, probably on account of the long established prerogative of surgery in the region. Splendid results, though, have been obtained. Kroenig has in his series a case radiated after laying back a flap of skin—no return at time of writing, nine months after—so a cancer *en cuirasse*, rejected as inoperable, he has cleared up with no return in five months.

And so a case, or is it two cases? of breast cancer, observed for but a few months, is the basis for to-

ment-fixation test resulted positively. The earliest appearance of a positive reaction in a primary attack of posterior urethritis, without complication, occurred in the sixth week.

7. In a number of cases of chronic recurrent urethritis with acute exacerbations, the test was invariably positive; many of these patients undoubtedly had prostatitis.

8. The reaction resulted positively in one-third of all cases of chronic posterior urethritis; undoubtedly many of these cases had a mild or low-grade prostatitis.

9. In 52.08 per cent. of cases of chronic prostatitis a positive reaction was obtainable.

10. Two-thirds of all stricture cases demonstrated a positive test.

11. In epididymitis a positive complement-fixation test was observed in 87.5 per cent. of cases. If, from our series, one case probably tuberculous, may be eliminated, and a time duration of five weeks can be imposed, the positive result in this form of disease has been 100 per cent.

12. In arthritis, undoubtedly gonorrheal in character, positive reactions were obtained in 100 per cent. of cases.

13. In the diagnosis and differential diagnosis of pelvic disease in women, the gonococcus-fixation test is destined, unquestionably, to play an important rôle. We have been unable to obtain any positive results in uncomplicated urethritis, vulvovaginitis and Bartholinitis, and it would appear that the infection must ascend at least to the level of the uterus in order to produce a positive blood response.

14. Inoculation of gonococcus bacterin, anti-gonococcic serum, etc., may in themselves by the production of immune bodies be causes of positive reactions. How long these immunizing effects may endure is unknown, but we have observed patients, treated by immunotherapy, who one year later demonstrated negative complement-fixation reactions.

15. Although the bacteriological demonstration of the gonococcus culturally is the only absolute method for its identification in chronic inflammatory processes, the method as a routine procedure is impractical and susceptible of many failures and fallacious results, so that the complement-fixation test is not only less laborious, but is productive of a higher percentage of positive findings. . . . "

—W. M. B.

ROSWELL PARK.

The sudden death on February 15th of Roswell Park, professor of surgery at the University of Buffalo, removes a conspicuous figure from among America's prominent surgeons. Of distinguished American ancestry on both sides, he was born in New England in 1852. Throughout his entire medical career he has been identified with teaching, first of anatomy in the Woman's Medical College of Chicago, and the Chicago Medical College, then of surgery in Rush Medical College and the North-

western University. He held the chair of surgery in the University of Buffalo for over twenty years, and was, perhaps, the most conspicuous figure in the medical school of that institution.

Dr. Park was an ardent supporter of the theory of a parasitic origin of cancer, in which view he was no doubt largely influenced by Gaylord and other workers in the N. Y. State Cancer Laboratory at Buffalo, of which Park was a director. In addition to various monographic and other contributions to surgical literature, and to his labors as a medical editor, he has left two meritorious books—his "Modern Surgery," a large text-book, and an interesting but somewhat epitomized "History of Medicine."

Surgical Suggestions

In differentiating syphilitic from other bone lesions a negative Wassermann reaction is not diagnostic.

The error is often made by capable Roentgenologists of mistaking the normal bone grooves of meningeal arteries for lines of skull fracture. Familiarity with the location of these grooves and comparative radiographs of the opposite side will obviate such an error.

It is worth remembering that in Hodgkin's disease the glandular enlargements may be confined for a long time (even a year or more) to one side of the neck. In clinically differentiating this chronic, localized adenopathy from that of tuberculosis, absence of softening and of fusion of the glands, daily marked elevations of temperature, increasing anemia, and enlargement of the spleen, some or all of which signs and symptoms are usually present, are fairly diagnostic. A negative von Pirquet reaction, and a thick, doughy, pasty-appearing skin may also help the diagnosis.

An acutely appearing almond-sized or larger swelling in the skin of the submental region, which the patient usually thinks is an inflamed gland, is not an uncommon winter occurrence, especially in women, from exposure to the cold. No treatment is necessary other than protection of the part from further chilling. The prominences of the cheeks may also be thus affected, but less frequently. Sudden swelling and redness of the nose, frightening the patient into a diagnosis of erysipelas, is a less common "frost-bite" experience.

Surgical Sociology

Ira S. Wile, M. D., Department Editor.

THE PANAMA-PACIFIC INTERNATIONAL
EXPOSITION, 1915.

In connection with the International Inter-
national Exposition, arrangements are being made for the
establishment of a permanent hospital building. The
equipment is to be supplied entirely by the U. S. Navy.
Dr. R. N. Woodward, at present in command of the
United States Marine Hospital, situated in the
Golden Gate, has been appointed to be in charge of
this hospital. From the start, the hospital building,
no pains will be spared to make the equipment as
modern as is possible, from the most modern X-ray
ambulances to the most modern means of transport for
the simplest operative procedures.

The purpose of the instrument is achieved by its name: an emergency hospital. Still, however, the temporary patient's health will not be endangered by removal to his home or to another hospital; he will be permitted to remain and receive the necessary medical and nursing attention until able to stand transportation to his residence or to his family.

In contrast, with this model emergency hospital, there would be a distinct advantage in having a solid out-patient department, with social service equipment and indeed in the form of the kitchen, laundry and other essential departments of a solid hospital.

The principles of American machine in the Panama Canal served as an excellent reason for placing stress on mechanical, structural and sanitary equipment in the design of the canal. The canal was built through the cooperation of the mechanical and sanitary engineers and the civil and electrical engineers and perseverance was the work of the canal board of engineers. All have been successful.

[illegible]

2 If the management, government, or other authority be used well, it will be a great blessing to the people.

prepared to retain the patients in the ward for at least eighteen to twenty-four hours after the operation.

Children with enlarged tonsils and adenoids are sent to institutions to undergo an operation which will leave the throat and nose in a normal condition. Unless this end is accomplished, the work cannot be regarded as properly done. Some follow-up system which would indicate the end-result of operations upon the tonsils and adenoids probably would reveal the fact that many of the operations have failed to accomplish the purpose for which they were devised. Too frequently outside of pain and suffering for the children and the consciousness on the part of parents that they have attempted their duty to their children, little worth mentioning is accomplished. Unnecessary operations are to be deprecated. Improperly performed operations are to be condemned.

The responsibility for good surgical treatment rests upon the institutions whose staffs are directly responsible. It is indeed time that surgical procedures, formerly deemed of minor importance, should be given more serious thought in order that the public may not come to the conclusion that a large proportion of operators are mere bunglers. Humanitarian interests demand that the safety, welfare, comfort, and health of the child should be given as much consideration in the performance of a tonsillectomy as in the amputation of any other portion of the body. There are inherent dangers in all operative procedures, but aside from these, there need be no unnecessary hazards of shock, hemorrhage, mutilation, or recurrence. Surgical procedure and surgical technic of the highest order are mandatory in order to relieve the profession from the criticisms now being leveled against the operations for tonsils and adenoids, as indiscriminately performed by incapable, indifferent, or negligent operators.

Book Reviews

Surgery of the Upper Abdomen. In two volumes. By JOHN B. DEEVER, Sc.D., LL.D., Professor of the Practice of Surgery in the University of Pennsylvania; Surgeon-in-Chief to the German Hospital, and Surgeon to the University Hospital, Philadelphia; and ASHLEY PAXTON COOPER, A.H.U.R.S.T., A.B., M.D., Instructor in Surgery in the University of Pennsylvania, and Associate Surgeon to the Episcopal Hospital, Philadelphia. *Volume II, Surgery of the Gall-Bladder, Liver, Pancreas and Spleen.* Octavo; 490 pages; 52 illustrations. Philadelphia: P. BLAKISTON'S SON & CO., 1914. Price \$5.00, net.

Almost five years have elapsed since we reviewed at some length (AMERICAN JOURNAL OF SURGERY, May, 1909) the first volume of this work, devoted to the surgery of the stomach and duodenum. We have awaited the appearance of the second volume with very great interest. A survey of the immense amount of literature, the digestion of which its preparation has entailed, affords some explanation of the time that preparation has consumed; and the delay in its appearance makes it all the more welcome, because it is correspondingly more complete and up-to-date.

In the review of the first volume we sufficiently indicated the character of the work—its thoroughness and breadth of critique. This volume is written in the same manner. It represents a very painstaking study of all the literature, balanced in its presentation by the author's experiences, especially that of Deever. At the end of each chapter the bibliography is appended. About 650 authors are referred to in the double-column six-page index of names. This is the amount of literature actually included; a great deal more, of course, must have been examined.

Two chapters (150 pages) are devoted to the surgery of the gall bladder and biliary ducts; one (50 pages) to non-bacterial, non-neoplastic affections of the liver; one (20 pages) to tumors of the liver, gall bladder and ducts, and one (about 18 pages) to injuries of the liver and biliary passages. The surgery of the pancreas occupies two chapters of about 130 pages, and that of the spleen one chapter of 60 pages. All the operations are grouped in the final chapter of 45 pages.

The pathology appears to us to be very sound; and the operations recommended are those we believe now practiced by the most expert abdominal surgeons. We are pleased to note, for example, that the authors recommend, in cholecystectomy, dislocation of the liver through the wound; removal of the gall bladder from within outward, after ligating the cystic vessels and dividing the cysticus; splitting and stripping the serosa over the gall bladder and suturing these peritoneal flaps over the raw liver surface. This, it seems to us also, is the cleanest type of cholecystectomy, the safest in technic, and the most surgical in "toilet." To be sure, it is not by any means always applicable, and especially not in cases of gangrenous, distended gall bladders in obese subjects; but it is the ideal method, and is to be recommended in all cases where it can be expediently employed.

The Modern Hospital. Its Inspiration; its Architecture; its Equipment; its Operation. By JOHN ALLAN HORNSBY, M.D., Secretary, Hospital Section, American Medical Association, etc., and RICHARD E. SCHMIDT, Architect, Fellow, American Institute of Architects. Large octavo; 644 pages; 207 illustrations. Philadelphia and London: W. B. SAUNDERS CO., 1913.

Recent years have marked a steadily increasing interest in the problems of hospital construction and administration that is rapidly approaching, if it has not already attained, the form of an "intensive study," and which is participated in not only by architects, lay and other trustees, and salaried superintendents, but also by a goodly proportion of the medical profession and the public. The haphazardly built hospital, conducted independently of methods and purposes now standardizing, is suffering close scrutiny, and faces the prospect of early modification or extinction.

As representative in America of this increasing interest in hospital construction and administration, may be cited the activities of the American Hospital Association, the formation of the Hospital Section of the American Medical Association, the establishment last year of a splendid journal, *The Modern Hospital* (under Dr. Hornsby's editorship), and the development of the literature of the subject, from occasional fragmentary works to dignified treatises. The latest and most comprehensive and, we believe, the most authoritative, of these is the excellent work before us, written by Dr. John A. Hornsby, for several years superintendent of Michael Reese Hospital in Chicago, with the collaboration of Mr. Richard E. Schmidt, architect.

The sub-title of the treatise fairly indicates its scope. Indeed, it covers the special features and general principles of hospital construction, and the multitudinous details of equipment; financial management; general and department administrations; subdivision of medical work; ward, operating room and laboratory activities; supplies; social service; out-patient work, etc., etc.

Each of these main divisions might well occupy a separate volume; yet they are handled in a thorough fashion and with few details unconsidered. To be sure, much of the work is based on personal experiences and personal preferences. The conduct of large hospitals has not yet

Surgical Experiences in South Africa 1899-1900. Being Mainly a Clinical Study of the Nature and Effects of Injuries Produced by Bullets of Small Calibre. By GEORGE HENRY MAKINS, C.B., F.R.C.S., Senior Surgeon to St. Thomas' Hospital, London; one of the Consulting Surgeons to the South African Field Force, etc. *Second edition.* Small octavo; 504 pages; 105 illustrations. London: OXFORD UNIVERSITY PRESS, 1913. Price \$3.75.

Although the South African war passed into history before the beginning of this century, this much quoted book has lost none of its interest, for it deals casuistically with gunshot injuries of the same character as have been encountered in still more recent wars conducted with modern firearms.

This edition is practically a reprint of that of 1901 except for the continuation of a few of the case histories.

Manual of Surgery. By ALEXIS THOMSON, Professor of Surgery, University of Edinburgh; Surgeon, Edinburgh Royal Infirmary; and ALEXANDER MILES, Surgeon, Edinburgh Royal Infirmary. *Volume III. Operative Surgery. Second edition.* Octavo; 620 pages; 255 illustrations. Edinburgh, Glasgow and London: HENRY FROWDE and STODDER & STOUGHTON, 1913. Price \$3.50.

Very little can be added to the favorable criticism of the first edition of this manual of surgery, made some time ago. One is again impressed by the clarity and terseness of the text, the up-to-date character of the descriptions of operations, and the general excellence of the illustrations. Concerning the latter, however, it should be stated that the illustrations accompanying the sections devoted to the ligation of arteries are very hazy and too diagrammatic. It is also strange to see the cerebral decompressive craniotomy depicted on the left side of the skull. The authors have adopted, wisely, it is believed, the Basle anatomical nomenclature in this edition, but place the old terms in parentheses wherever the newer ones are employed.

Chirurgische Operationslehre. Herausgegeben von AUGUST RIEB, Berlin; HEINRICH BRAUN, Zwickau; HERMAN KUEMMEL, Hamburg. *Vol. III. Operationen am Mastdarm, an den Harn- und Mäcchlichen Geschlechtsorganen, und an den Extremitäten.* 986 pages; 797 illustrations, mostly colored. Leipzig: JOHANN AMBROSIOUS BARTH, 1913. Price \$12.00.

The first part of this monumental work on operative surgery has been reviewed in the AMERICAN JOURNAL OF SURGERY. It was then pointed out that the three authors have collaborated with and have valuable contributions from many prominent German surgeons. Only two of the sections of this volume (operations on the kidney, renal pelvis and ureters; operations on the prostate) have been written by one of the three authors (Kuemmel). Each of the volumes is an entity, with its own bibliography, index, table of contents, etc. This one, of nearly a thousand pages, is of the same high standard of excellence as the preceding one reviewed in these columns. Examining it cursorily, one gains the impression that it is a colored atlas of surgical procedures, so replete is it in magnificent drawings, photographs, and colored plates at every turn of the pages. A study of the text, however, shows that this does not occupy a place of second importance. Each operative procedure has been subjected to a careful analytical criticism, and that operation is fully described which is deemed the best by the authors. The choice is generally a very happy one, we believe, but the insignificant place often given to the work of surgeons other than Germans cannot be overlooked. Nor is there a uniformity of thoroughness in the treatment of the various sections of the book. The most adverse criticism must be made of that dealing with operations upon the rectum, in which the text is too brief and too dogmatic, the illustrations not well chosen, and the bibliography too fragmentary.

It can safely be prophesied, however, that this work on operative surgery will prove one of the standards on the subject because it is, in general, so thorough, so clearly presented, and so aptly illustrated.

Principles of Surgery. By W. A. BRYAN, A.M., M.D., Professor of Surgery and Clinical Surgery at Vanderbilt University, Nashville, Tenn. Octavo; 677 pages; 224 original illustrations. Philadelphia and London: W. B. SAUNDERS COMPANY, 1913. Price \$4.00, net.

This book may be described as a combination of surgical pathology, bacteriology and diagnosis. Although no one of the three is exhaustively presented, their fusion in one work, clearly and logically presented, makes an attractive book for the student. Upon an examination of the composition of the book it is at once evident that the fragmentary remarks upon treatment scattered here and there through the volume are entirely out of place and detract from its merit. Otherwise Bryan's "Principles" impresses the reviewer as a very desirable and a very careful analysis of our present knowledge of the subject. The work is not meant for the advanced student; yet a full bibliography would enhance its value. The illustrations and typography are excellent.

Operative Surgery for Students and Practitioners. By JOHN J. McGRATH, M.D., Clinical Professor of Surgery, Fordham University; Professor of Operative Surgery, New York Post-Graduate Medical School; etc., etc. *Fourth revised and enlarged edition.* Octavo; 838 pages; 364 illustrations. Philadelphia: F. A. DAVIS COMPANY, 1913. \$6.00, net.

In this edition the author has endeavored to bring the work up-to-date, especially in regard to surgical technic. The reader will find all the operations of any importance described with considerable completeness, but it is to be regretted that McGrath has omitted critical studies of the relative values of the various groups of operations. Such analyses, by guiding the reader through the pages, would greatly enhance the value of this excellent book.

Genito-Urinary Diseases and Syphilis. By EDGAR G. BALLENGER, M.D., Adjunct Clinical Professor of Genito-Urinary Diseases, Atlanta Medical College; Editor, *Journal-Record of Medicine*, etc., etc. Assisted by OMAR F. ELDER, M.D. *The Wassermann Reaction.* By J. EDGAR PAULLIN, M.D. *Second edition, revised.* Octavo; 529 pages; 109 illustrations. Atlanta: E. W. ALLEN & Co., 1913. Price \$5.00, net.

The first edition of this work has required very extensive revision in order to carry it up-to-date. It is evident that the authors have been carefully studying the recent literature of their subject. The result is that such topics as vaccine therapy, the tests for functional activity of the kidneys, pyelography, etc., etc., will be found fully discussed. The book is one that should be very useful to those who do not wish to study the exhaustive works on genito-urinary diseases and are not satisfied with the elementary ones. It is very practical and contains much useful information and many valuable suggestions.

The Elements of Bandaging and the Treatment of Fractures and Dislocations. By WILLIAM RANKIN, M.A., M.B., Ch.B., Dispensary Surgeon, Western Infirmary, Glasgow. Small octavo; 116 pages; 68 original illustrations. London: HENRY FROWDE and HODDER & STOUGHTON, 1913. Price \$1.50.

This small book is meant for those who have had very limited experience. The subject of bandaging is treated briefly and most of the remainder of the book is devoted to the diagnosis and the treatment of fractures. Many valuable practical points are succinctly presented, but the reviewer must take issue with a number of statements rather dogmatically made. For example, it is a bold assertion to make concerning fractures of the elbow that if "it is possible to fully flex the arm up to an acute angle, then in every such case a good result as regards appearance and function will be attained if the arm is fixed up by means of plaster-of-paris bandages * * * for four or five weeks." Rankin's book should nevertheless prove of value to those for whom he has written it.

followed by the appearance of gastric ulcers. Steinharter attempted to produce the lesion by using colon bacilli. It has long been known that an emulsion of colon bacillus in the presence of free hydrogen ions can be agglutinated in from one to four hours when incubated at body temperature. Gastric juice also possesses this power. Steinharter used 1/12 normal HCl to clump the colon bacilli and then injected the washed centrifugal sediment into the blood stream of rabbits. The animals showed hemorrhagic erosions at the pyloric end of the stomach, the other organs being normal. These lesions appeared within twenty-four hours after injection in some of the protocols presented by the author. He believes that the hyperacidity and constipation together with the presence of *E. coli* may have a good deal to do with the etiology of human gastric ulcers.

Jackson's Pericolic Membrane. Its Nature, Significance, and Relation to Abnormal Mobility of the Proximal Colon. JOHN MORLEY, Manchester. *Lancet*, December 13, 1913.

1. Jackson's pericolic membrane is of congenital origin and is non-inflammatory. 2. It occurs in association with abnormal mobility of the proximal colon, due to a failure of fusion of the ascending mesocolon with the posterior parietal peritoneum. 3. The great omentum, from which Jackson's membrane is derived, is the most primitive agent in fixing the proximal colon to the parietes in the right loin. In cases of mobile proximal colon Jackson's membrane may be the principal means of fixing the colon. 4. Unless it causes kinking of the colon a pericolic membrane is therefore rather useful than harmful, and should not be divided. 5. The symptoms and pathological conditions found in association with Jackson's membrane (apart from mechanical obstruction due to the membrane) are primarily due to stasis in the abnormally mobile proximal colon, which is ill-adapted to the upright posture. 6. Surgical treatment should be directed to securing the normal position and fixation of the proximal colon by the operation of colectomy.

Further Observation On the Complement-Fixation Test in Gonococcus Infection. HARRY L. ROOKWOOD, Cleveland. *The Cleveland Medical Journal*, December, 1913.

Among some of the points emphasized by Rookwood are the following: In cases of acute gonococcal urethritis of short duration the blood serum shows no evidence of antibodies. In cases of non-specific acute urethritis of several weeks' duration the negative serum reaction is of much value. In cases of chronic urethritis in which gonococci were present in the discharge, the test was positive in almost every case. In chronic gonococcal urethritis of long duration where no cocci could be demonstrated in the discharge, 60 per cent gave positive reactions. The test is of great value in the cases which are clinically cured, especially when the question of matrimony is raised, for no man should be allowed to marry until his complement fixation test reacts negatively.

Accidental Injuries to the Descending Portion of the Duodenum During Removal of the Right Kidney. W. J. MAYO, Rochester, Minn. *Journal American Medical Association*, January 31, 1914.

Mayo points out that the anatomic relations of the retroperitoneal portion of the duodenum are such that this organ may be injured during operations for the removal of the right kidney when there is infiltration about the pedicle causing close adhesion to the duodenum. It not infrequently happens in such cases that the vessels are torn, causing hemorrhage calling for active hemostasis. In the attempt to check the hemorrhage by using strong biting forceps the duodenum may be seized and necrosis follow the injury with the resulting distressing fistulas and death. He has known three such cases and believes that the accident is more common than the records show. The vena cava is even more frequently injured and he thinks that the forceps is seldom necessary until after the vessels have

been caught and the hemorrhage stopped by the finger. Other arterial injuries are mentioned as liable to occur in such operations of kidney removal. When there is much infiltration and nephrectomy is not advisable, it is best that one should see that there is no opening into the peritoneum. The different characters of kidney tumors are noticed by Mayo, especially in malignant disease involving the pelvis and calices and other structures in which the duodenum is liable to be injured even by the most expert and careful surgeon. As a rule the duodenal injury is not made manifest for several days after the operation and the fistulas do not tend to heal. In a case like this, in which the fistula was large, infiltrated and without peritoneum, he would make a transperitoneal attack on the fistula itself before the patient becomes exhausted, lift the descending duodenum from its bed, suture the opening, transplant a flap of omentum across the suture line and finally make a jejunostomy for temporary feeding purposes. Such an operation, however, while easy to figure out on paper, is sufficiently difficult to make us careful to avoid the accident requiring it.

Epididymotomy. C. P. KNIGHT, Stapleton, N. Y. *Journal American Medical Association*, January 31, 1914.

Knight says excellent results have been obtained by him at the United States Marine Hospital, Stapleton, N. Y., with Eckel's method of operating for epididymitis. Instead of a blunt probe for puncturing the epididymis Knight uses a blunt-pointed needle, which he considers better, and he has employed local anesthesia in several of his cases which he thinks also more advisable. He agrees with Eckel that the operation should be the procedure of choice and that it should be early to avoid pus and abscess formation. Five cases are reported. His conclusions are summed up as follows: "1. There is immediate abatement of all symptoms for which the patients seek relief. 2. The tendency to relapse is nil. 3. The operative procedure is without danger as regards anesthesia, because the general anesthetics can be eliminated. 4. This operation, as compared with the other methods of treatment, is one of utmost importance from an economic point of view, not only to the patient, when loss of time from daily labor is considered, but also to the hospital in its economic administration, by greatly diminishing the number of days of treatment."

A Method of Removal of Carcinoma of the Prostate. R. HOWARD, London. *Lancet*, December 13, 1913.

This method is rather novel. First, an ordinary suprapubic cystotomy is performed and the bladder is packed with a sponge. In the lithotomy position a perineal incision is made and the rectum completely separated from the structures in front until the seminal vesicles are reached. At the same time the fibres of the levator ani are divided on each side so as to free the prostate and the base of the bladder laterally. The patient is then placed in the Trendelenburg position. The suprapubic incision is enlarged downward so as to admit the whole hand, and the peritoneum is stripped back from the bladder. The posterior layer of the triangular ligament is dissected from the pubis and the urethra divided distally from the fascia. The separation of the lateral aspects of the bladder and prostate is completed, and the prostate, still in its fibrous capsule, is brought out of the suprapubic wound. The base of the bladder is then amputated just above the line of entrance of the ureters and the bladder dropped back into position. A rubber catheter is passed along the urethra into the bladder and out through the suprapubic opening. Both wounds are closed with drainage. The after result in one patient was excellent.

The Significance of Phleboliths. J. HALL-EDWARDS, Birmingham. *British Medical Journal*, December 13, 1913.

The author calls attention to the unusual frequency with which shadows of phleboliths are found in x-ray examinations for suspected kidney stones. These shadows are seen either associated with renal calculi or without. In some of these cases the phlebolith shadows were only

ceps introduced into the theca through the primary opening; the tendon is made to descend as far as possible towards the wound by flexing the wrist-joint and massaging the forearm muscles. If by these means the tendon cannot be caught, it must be picked up through another incision made higher up in the manner described below. To carry out this procedure a flexible bullet probe with an eye-hole cut in the bulbous end is required. In the fingers an incision half an inch in length is made directly over the line of the tendon at a level with the neck of the metacarpal bone; after division of skin, subcutaneous tissue, and the thin expansion of the palmar fascia, the sublimis tendon (lying close over the profundus) will be found very near the surface. The theca (in this situation frail and thin) is opened and the divided tendon or tendons are drawn out through the wound; the bulbous end of the probe is then passed from the primary wound through the theca and made to emerge at the secondary opening. A suture is fixed to the cut tendon and threaded through the eye of the probe. The probe is then drawn back and out again at the primary incision bringing the tendon with it.

In the case of the thumb a similar procedure is carried out, but the tendon must be picked up on the proximal side of the wrist-joint. A three-quarter inch incision is made extending upwards from the level of the wrist-joint directly over the ulnar border of the flexor carpi radialis tendon; this tendon is pulled to the radial side, the median nerve is gently displaced ulnarwards, and the tendon of flexor longus pollicis will be seen lying deep and between these two structures. The tendon will be lying slack, and on this account may appear a little like the median nerve. The theca is incised and the tendon pulled out. Sometimes it may not slip out quite readily; this is usually due to a failure to open the theca, which is thin and not very obvious in this situation. The probe is then passed and the cut tendon drawn back into the primary wound as described above.

Fixation of the cut ends of the tendon.—Any one of the advocated methods for suturing the cut ends may be employed; it should, however, be remembered that adaptation of the cut ends without causing any abnormal deviations is more important than close apposition of the cut surfaces. In some cases, especially in children, it is difficult to get a good hold of the tendon with the suture. In such cases the best plan I think is to hold the cut ends of the tendon successively, at their proper level in the theca; then pass a suture from side to side of the theca, piercing the tendon about a quarter of an inch from the point of section; tie the suture with sufficient firmness to hold the tendon in position. Simple iodized catgut should be used for this procedure. Though absolute apposition of the cut surfaces is not obtained by this means, the ends of the tendon lie in their normal relationship and quite close enough for satisfactory healing to take place.

Torn Semilunar Cartilages. WM. ROBINSON, Sunderland. *British Medical Journal*, January 17, 1914.

Robinson reports his observations of 24 cases. Of these 22 were tears of the inner cartilage, and two of the outer. The patients were all males, usually of the muscular, robust type. Robinson has never seen a simple dislocation of a semilunar cartilage without tearing of the cartilage. There can be a tear without a displacement, but no displacement without a tear. The author discusses fully the anatomy and mechanism of the injury. The diagnosis can be made entirely from the history. In nearly every case the following facts may be elicited:

1. A severe twist of the flexed knee or a severe blow on the side of the flexed knee, with or without the patient falling.

2. A sickening pain, and often a sensation of something having given way in the joint.

3. "Locking" of the joint, that is, inability to extend the limb (if the anterior part of the cartilage be torn) or, much less often, to flex it (if the rent is in the posterior half). The joint sooner or later goes straight of itself or by a special effort on the part of the patient, or is pulled straight by someone—generally with a feeling as if something had slipped into its place.

4. A temporary effusion into the joint (traumatic synovitis).

5. One or several recurrences of the above symptoms, especially of "locking" of the joint on slighter but similar accidents, such as slipping off a curbstone, twisting the leg in walking, or even turning over in bed.

When the patient applies to the surgeon often nothing can be made out on examination of the joint except some tenderness over the injured meniscus—inner or outer, as the case may be. If the femur has been rotated inwards (or the leg outwards) almost always the inner meniscus will be found torn. If the rotation of the femur is outwards (or of the leg inwards) one cannot be so certain that it will be the outer meniscus that will be found ruptured (see notes of cases).

The only treatment in workmen is removal of the offending cartilage.

The Importance of the Treatment of Weak Feet in Childhood. FRANKER H. WHITLOCK, New York City. *New York State Journal of Medicine*, January, 1914.

After showing how common a disability flat-foot is, as proven by records of the armies and navies of various countries, the author pleads for a more general recognition of this condition in childhood, at which time much of its dangerous character may be averted. Weak foot is the most disabling and widespread of all postural deformities affecting all classes of society and occupation. A decidedly large number of cases exist from early childhood. As a result of various causes, faulty attitudes are assumed for the feet which, though not necessarily causing disability in childhood, are nevertheless powerful factors for harm in adult life.

Heliotherapy in Tuberculosis. HERMANN VON SCHRÖTER, Vienna. *Medizinische Klinik*, December 21, 1913.

The author believes that the treatment of tubercular disease by means of exposure to the sun's rays, which is coming more and more into general use, is of as much avail at sea level as it is in mountain regions. The result depends not so much on the intensity of the light as on the duration of the exposure. Natural sunlight is of considerably more therapeutic value than artificial rays, such as those of the Quartz Lamp, though the latter may be of use to further the treatment on days when there is no bright sunshine.

Chemical work seems to show that the pigment which is developed in the skin after exposure to light is derived from breaking down of the Rete Malpighi cells, as a result of the light rays. These cells the author moreover considers as related physiologically to the adrenals.

Heliotherapy, although not as yet shown to be of definite value in pulmonary cases, has proven of undoubted efficacy in surgical tuberculosis.

Primary Carcinoma of the Appendix. LOUIS RASSIEUR, St. Louis. *The Journal of the Missouri State Medical Association*, December, 1913.

Rassieur reports two cases of primary cancer of the appendix, the first in a married woman of thirty-three who was operated on for uterine retroversion, the appendiceal lesion being a chance find; the second in a single woman of thirty-one, who gave symptoms of chronic appendicitis. The author reviews the literature of the subject, commenting on the fact that now that cases are studied more carefully, more cases of carcinoma of the appendix are finding their way into the literature, and the condition is no longer considered as great a rarity as it was formerly. The lesion is usually located at the tip of the appendix or within a centimeter of the tip. Its size varies from a pin-head to a small Mandarin orange. On section it is usually yellow in color. The rule is that these growths are relatively benign, do not form metastases, nor recur after removal.

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The longitudinal incision, extending from the umbilicus to the pubis, is made in the midline. The various methods of securing the abdominal wall are used not only for the purpose of obtaining a liberal opening into the abdomen in certain conditions, but also to permit the closure of the abdominal layers and by reformation. The rather longitudinal incision through the linea alba had several noticeable features. The most important of these were: the high degree of traction necessary to overcome the bilateral pull of the transversalis and internal oblique muscles and the difficulty of obtaining solid union between the two edges of a single mass. The incision was then made more and more lateral from the linea alba, until at present a great number of surgeons, both here and abroad, by preference make a liberal longitudinal incision through the rectus muscle at a considerable distance from the midline of the muscle. This incision was usually in the upper abdomen, two-thirds of the way down, along with the additional midline incision below it.

The incision is conservative only insofar as the rectus muscle itself and perhaps to the diaphragmatic and internal transverse muscles under the muscle, but it puts pressure on, if not through all other important structures of the abdominal wall. These structures are, firstly, the other supporting fasciae, and the intercostal nerves. The severed fasciae can be made to reform, and the permanent damage to them may not be great, but the destruction of the nerves causes a deterioration of practically all the tissues which lie in the area between the incision and the umbilicus. That the deterioration frequently results in a weakening of the supporting tissues and subsequent hernia has been known for a long time. But it is not the other structure involved? What does this structure mean?

From time to time, I have had occasion to generate

A series of experiments of this type was conducted by the writer in an endeavour to learn whether or not the degeneration of the peripheral nerve supplying the vertebrae could result in a

any anatomical changes in the peritoneum, with special reference to adhesion formation.

The plan adopted was as follows:

GROUP I. Under aseptic conditions, to make an incision near the costal margin on one side and sever the last 3 or 4 intercostal nerves (the 12th, or subcostal, is included under the term "intercostal" throughout this paper); after some time, to explore the abdomen and learn whether the destruction of the nerves alone caused any changes in the peritoneum supplied by these nerves.

GROUP II. To open the abdomen through the linea alba, in a number of animals, the incision to be placed in the lower part of the epigastrium so that the peritoneum supplied by the last four intercostal nerves could be easily reached; to traumatize the parietal peritoneum on each side of the incision and to exercise the greatest care that the degree of injury inflicted should be as nearly alike on the two sides as possible; to close this incision; and lastly to make a second lateral incision and sever the lower intercostal nerves on one side.

GROUP III. To perform the same operations, traumatize the peritoneum and cut off the nerve supply on one side, and to add an irritant or a mild infection to the peritoneum, and in the same dosage to each side of the abdomen.

The trauma was inflicted by rubbing the peritoneum on both sides with fingers or forceps wrapped in a definite amount of gauze; by rubbing the same number of times and in the same direction on each side; and by using as nearly as possible the same amount of force to each side.

The irritant used was a weakened tincture of iodine. The infection was a solution of gastric or intestinal contents obtained from the same animal on which it was used. It was assumed that an auto-genous infection of bacteria would be more easily overcome by the animal than foreign bacteria, which might originate an uncontrollable peritonitis.

All these means and methods are fairly accurate and easy of application, except the necessity of applying an exactly equal amount and kind of force to each side in making the trauma. This must depend on the judgment and experience of the operator, and cannot be mathematically accurate. However, I believe it possible to exercise sufficient care in bruising the peritoneum by hand to make the margin of error almost negligible. In a series, this margin of error would probably break even for both sides.

Three experiments were made in Group I, extirpation of intercostal nerves without disturbing the peritoneum. In Group II, 8 animals, 5 dogs and 3 rabbits, were used. An incision was made in the

linea alba, the peritoneum was rubbed equally on both sides, the wound closed, and then the lower intercostal nerves were excised on one side through a second incision. In Group III, 7 experiments were made. The peritoneum was rubbed on both sides through a median line incision, then tincture of iodine was applied in two animals, gastric contents in two, and intestinal contents in three. After closing the median line incision, segments from the 10th, 11th and 12th intercostal nerves were removed near the costal margin on one side. It might be added that the solutions used, both of iodine and of gastric and intestinal contents were very weak.

REPORT OF OPERATIONS AND EXPERIMENTS.

GROUP I.

Dog No. 1.

Operation, February 8, 1912. Under strict aseptic precautions an incision was made along the left costal margin from the epigastrium to a point near the crest of the ilium. The incision extended through the muscles and to the fascia transversalis. The last five intercostal nerves and the ilio-hypogastric were dissected out and a segment of each extirpated. The wound was closed.

February 19, 1912, an exploration was made through a median line incision in the epigastrium of the same dog. There were no adhesions to the parietal peritoneum anywhere. The peritoneum appeared normal. The wound was closed in layers, the peritoneum being touched only to suture the edges together.

Another incision was then made along the right costal margin through the muscles and through the fascia transversalis. The last five intercostal nerves were dissected out and a section removed from each. The wound was closed. All wounds healed without suppuration.

March 6, 1912, the abdomen was reopened for examination. The omentum was found slightly adherent over the middle third of the peritoneal suture line in the epigastrium. The peritoneum on both sides had a normal glossy and transparent appearance.

Dog No. 2.

Operation, April 29, 1912. An intestinal resection was made on this dog through a median line incision at the umbilicus. The loop of bowel was lifted out of the abdomen and surrounded with moist gauze during the operation. The parietal peritoneum was not touched with gauze. The wound was carefully closed in layers.

A second incision was then made across the lower ribs on the right side, 3 cm. from the costal margin

Rabbit No. 1.

Operation, April 30, 1913. Incision through linea alba in epigastrium; peritoneum on both sides rubbed hard once forward and back with one finger covered with gauze; wound closed; three lowest intercostal nerves on left side excised through incision across ribs behind costal margin.

Autopsy, May 12, 1913 (12 days after operation). rabbit (female), found dead; had been pregnant and miscarried after the operation; right uterus found empty; left uterus contained unexpelled rabbits, and placenta, but the placenta were detached. No visceral adhesions to abdominal wall; but on left side of linea alba was a transverse line of fibrin deposit adherent to the peritoneum.

Rabbit No. 2.

Operation, April 30, 1913. Midline incision in epigastrium; peritoneum rubbed firmly twice from the lumbar muscles toward the edge of the wound with artery forceps wrapped with gauze; the same on both sides; wound closed. Second incision at left costal cartilages and segments of the last three intercostal nerves extirpated.

Autopsy, May 19, 1913 (19 days after operation). Hernia of abdominal wall on left side; peritoneum roughened and omentum adherent at one point 2 cm. outside semilunar line on left side; adhesion 2 cm. in width.

Rabbit No. 3.

Operation, September 2, 1913. Incision through the linea alba from the center of the epigastrium to a point below umbilicus; parietal peritoneum rubbed equally on both sides with one finger wrapped in two layers of gauze, fresh gauze for each side; wound closed in layers with catgut. Second incision made across costal cartilages on the left side and sections of the last four intercostal nerves extirpated. Wound closed with catgut.

Autopsy, September 16, 1913 (14 days after operation). No adhesions to the parietal peritoneum. Peritoneum appeared normal on the right side, while on the left it was thickened and had a dull grayish white color over the area between the incision and the costal margin.

GROUP III.

Rabbit No. 4.

Operation, April 30, 1913. A median line incision, 5 cm. long, was made in the upper abdomen. One finger, covered with two layers of gauze, was swept over each side of the abdomen once forward and back. A piece of gauze carrying a few drops of tincture of iodine was touched gently to each side of the bruised peritoneum. Care was exercised that the sides of the abdominal wall should be given

equal treatment. Wound closed. Second incision made at the left costal margin and the 10th, 11th and 12th intercostal nerves and vessels severed. The incision severed practically all tissues down to the peritoneum.

The rabbit died three days after the operation. Autopsy showed the colon adherent to the anterior abdominal wall, the adhesions being decidedly more extensive on the left side. Intestine and liver stained with iodine. No adhesions between viscera. Rabbit No. 5.

Operation, September 2, 1913. Incision through linea alba at the lower part of the epigastrium. Dry gauze was wrapped around a Carmalt artery forceps and one hand rub made over the parietal peritoneum on each side; a piece of gauze containing a small amount of tincture of iodine was then touched to each bruised surface. The sides were treated as nearly alike as possible. After the treatment a faint iodine stain could be seen on each peritoneal surface. Wound closed with catgut.

Second incision at left costal margin through most of the muscle fibers down to the peritoneum; the last five intercostal nerves were severed and segments removed; three of the intercostal vessels were saved. Wound closed with catgut.

Autopsy, September 27, 1913 (25 days after operation). Whitened and thickened peritoneum over rubbed area on left side; right side normal. A lobe of the liver was firmly adherent at the central part of the traumatized area on the left side; no other adhesions.

Rabbit No. 6.

Operation, September 16, 1913. Median line incision at the center of the abdomen. Both sides of the parietal peritoneum were rubbed once forward and back and once in a dorso-ventral direction with an artery forceps wrapped in gauze. A small amount of gastric contents was obtained with a hypodermic syringe and diluted one drop in 4 cc. of sterile water. From this solution 4 drops were run over each side of the bruised peritoneum. Wound closed.

Second incision at the right costal margin where the last 4 intercostal nerves were extirpated and nearly all tissue fibers severed to the peritoneum. Wound closed.

Autopsy, October 28, 1913 (42 days after operation). An adhesion from stomach to linea alba at central part of incision. Peritoneum is whitened on both sides of the middle line to nearly the same degree.

Rabbit No. 7.

Operation, September 16, 1913. Median line in-

plied to the peritoneum was probably not much greater than that exerted by some surgeons while pushing gauze pads roughly into the abdomen, and, after the operation, carelessly jerking the pads out. In the later experiments the rubbing was done a little more energetically, yet in no instance to such a degree that subserous hemorrhages could be seen.

The peritoneum in the rabbit is very thin and delicate and undoubtedly it received a much harder rubbing in proportion to its strength than did the peritoneum of the dogs. As a probable result of this, there was found in the rabbits a more constantly appearing infiltration of the peritoneum than in the dogs. The omentum of the rabbit is very short and does not lend itself to adhesions as readily as that in the dog. In most of the dogs there were omental adhesions along the line of the peritoneal incision in the linea alba. This can be accounted for chiefly by the fact that the edges of the peritoneum were rubbed and handled more roughly than the distant parts. Tincture of iodine was used very freely on the skin and some of this drug, no doubt, added insult to the peritoneal margin. But in all cases where adhesions extended farther from the linea alba on one side than on the other the adhesions favored the enervated side.

Microscopic sections taken from the whitened areas of the peritoneum on the enervated side and compared with similarly situated sections on the normal side showed that the subserosa was much thicker in the former than in the latter. This thickening seemed to be due to a round-cell infiltration and an edema, which was absent on the normal side, two to three weeks after the operation. This tends to show that repair is delayed where the nerve supply has been removed. It proves that nature makes a noble and partly successful effort to repair the damage even in the absence of nerve supply, but that this repair suffers from a lack of that control which makes for rapid and perfect result.

A mild trauma or infection on a healthy peritoneum induces a temporary adhesion which may be released after the healing process of the serosa has been completed and absorption has taken place. These experiments suggest that in the absence of intercostal nerve relations the infiltration becomes more chronic, the healing defective, and therefore a more reluctant release of the adhesions is to be expected.

Very decided results were seen in the two rabbits where iodine was applied to the peritoneum. One died undoubtedly from bowel obstruction due to the adhesions to the parietal peritoneum. The adhesions were much more extensive on the enervated side, though by no means confined to that side. In

the other rabbit the whole rubbed area on the operated side was whitened and thickened and a lobe of the liver was adherent in the center of the area. The peritoneum on the other side appeared normal.

The combined injury from the rubbing and the iodine was probably greater than that applied in any other experiment. This suggests that if a higher degree of damage were inflicted on the peritoneum than that used in any of these experiments, the difference in reaction between the normal and the enervated side would be much more striking.

The two experiments with gastric contents were practically negative. The rubbing was made with forceps wrapped in gauze and was applied more gently than in most experiments. The gastric contents of a rabbit probably contain but few bacteria and in the small dose applied to the peritoneum even those few may have been missed, so that no additional reaction was called forth.

The intestinal infection used was very feeble, if indeed present in all cases. Yet in all the three instances where it was applied after rubbing, there were omental adhesions on the operated side and none on the normal side. Of special interest is the case where no adhesions were present after the application of gastric contents but an adhesion formed after colon infection was added.

In the case of a female rabbit having a miscarriage after the operation, it is interesting that the uterus on the side of intercostal nerve extirpation had been unable to empty itself. Whether this was merely a coincidence or whether the nerve destruction on that side had any influence on the uterine contractions, it is impossible to state.

If only the trunks of the intercostal nerves are extirpated at the costal margin or even between the ribs, one cannot be certain that the whole area supplied by these nerves is totally enervated. This may be true even if we overlook the probability that the nervi vasorum have some function beside that of strict vasomotor control. Nerve filaments may come off from the main trunk behind the point where the nerve is severed and pass unharmed in the transversalis fascia in the zones between the nerves. To obviate this possibility, the lateral incision in such experiments should sever all the tissues down to the peritoneum. This is exceedingly difficult to do, without damaging the peritoneum, and it was attempted in only a few of the experiments. It is probable therefore that the enervation was not so complete in any of the experiments as that produced in a laparotomy with a lateral longitudinal incision.

The question of time was not considered in these

THE PARALYTIC CONDITIONS OF CHILDREN — TREATMENT FROM THE GENERAL PRACTITIONER'S STANDPOINT.

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The recognition and treatment of the paralytic affections of childhood is of such importance that their reiterations should act as a stimulus to practitioners and specialists alike—the former to be on the alert to detect paralytic phenomena; the latter, to institute proper measures for their treatment.

I shall limit my remarks to the commoner forms of paralysis, as seen at the Hospital for Deformities and Joint Diseases where we have given about sixty thousand treatments in the past seven years to paralyzed children.

(1) *Central Congenital Lesions:* We find that cerebral birth palsies occupy an important place. These are general due to mechanical rupture of meningeal vessels, and secondary invasion of the motor zone by blood clot. The diagnosis of this condition presents no difficulties. There is usually a history of difficult labor. After a very little time, it is noticed that the child's extremities are rigidly adducted. Walking, perhaps, is impossible on account of the adductor spasm. The reflexes are exaggerated, the highest tap producing a violent response. If the later tracts have degenerated, we may find a Babinski reaction and ankle clonus. There is little or no atrophy; the electrical reaction is normal or decreased. Where there is a cortical agenesis or defective cortical development, there may be flaccid paralysis, due to maldevelopment of the lateral tracts. The reflexes in electrical reactions are, as a rule, normal, and moderate atrophy may be present.

(2) *Acquired Cerebral Palsy:* In the acquired type of cerebral palsies, we find hemiplegia the most prominent. These are associated with infectious diseases, cardiac conditions, surgical operations, or they may develop without any definite cause. A large percentage of these cases are syphilitic, no doubt. The history of the case and symptoms make the diagnosis easy. There are exaggerated reflexes, rigidity; normal electric reaction; no atrophy.

(3) *In Encephalitis, Spinal Meningitis with Paraplegia, Hemiplegia, or Monoplegia,* with or without a history of previous illness, we find flaccidity and mild atrophy; reflexes, absent or present; reaction, normal or not.

(4) *The Paralysis Due to Spinal Cord Lesions,* the most important of which are anterior poliomyelitis and compression paraplegias. The diagnosis of anterior poliomyelitis presents little or no difficulties. The history is one of previous well-being with the sudden onset of acute illness followed by a flaccid paralysis, which may affect any or most of the muscles of the body. Atrophy is an early condition in the affected muscles. There is also vasomotor paresis, giving the limb the characteristic blue, cold appearance. Reflexes are lost early, and the reaction of degeneration in the affected muscle completes the picture.

(5) *The Compression Paraplegias* of interest to us are those occurring in Pott's disease. The previous history pointing to the spinal affection and the kyphus would call attention immediately to the cause of the paralysis. There are pains radiating to the abdomen or down the legs, depending upon the location of the lesion; weakness, ataxia; paralysis; exaggerated reflexes; ankle clonus and Babinski phenomenon. In compression of lumbar segments, in addition to paraplegia, there appears involvement of the sphincters. The electrical reactions are normal; there is no atrophy early. Treatment, rest and counterextension.

(6) *Multiple Neuritis:* In paralysis due to peripheral causes, multiple neuritis takes first rank. This is usually a sequel of diphtheria or other infectious diseases. The paralytic phenomena in this condition appear slowly. Sensory symptoms are distinguishing features, and consist of pain, tenderness and hyperesthesia along the course of the nerve trunk. Foot- and wrist-drop finally appear and clinch the diagnosis. Atrophy and the reaction of degeneration appear soon after the paralysis. In a few cases of multiple neuritis of sudden onset with little or no sensory symptoms, the condition may be mistaken for anterior poliomyelitis, and a positive diagnosis between both conditions may be impossible. The course of the disease will finally help us. A history of diphtheria or exposure to the disease naturally counts in favor of multiple neuritis.

(7) *Facial Palsy:* Under facial palsy of Bell's type, I would suggest to the general practitioner to place a bent hairpin with a string attached, in the mouth, and tie the other end of the string tightly to the ear, in order to correct the deformity of the face. The exposure of the eye must be attended to also.

(8) *Traumatic Paralysis:* I come, now, to a form of paralysis of traumatic origin such as Erb's palsy, in which the parent is advised between treatments

to keep the patient in contact with the hand family, so that the education and cultural tradition. Also, in this group, as in the first, the Vollmann's analysis of occupational paralysis and the paralysis of using tools is not of operative fracture of the forearm, but whereas in the one or other of us, considered as peripheral nerve reuniting, the method of treatment, whether the nerve surgeons, seems to be in accordance with the mentioned severed nerve, namely with the restoration of disjunctive continuity.

10. The group of the "Moro" comprises two groups: are pseudotumorular hypertrophies and the muscular atrophies of Aran, Duchenne, and Charcot-Tooth-Marie. The latter consists of the hypertrophies are the most characteristic, and distinct hereditary, and that they progress slowly, largely to the detriment of the structures, namely the finger and wrist, and a corresponding deformity in their motor function, mild and fulminant, is rare; hence, are the diagnostic features. The reflexes are retained and the electrical reactions are diminished but never lost.

In the muscular atrophies, the onset of gradual wasting in early childhood of either the hands or legs, distinguishes this type of disease. The reflexes disappear when atrophy is well advanced and the reaction of degeneration is present in the involved muscles.

In a brief article on the kind of loss, some general ideas can be given concerning the prognosis. Since a large number of cases are seen in the hands, or for some other definite reason, the prognosis taken on the basis of the age of onset of the disease, be regarded as follows: (1) In the first group, which is the youngest, the prognosis is good, and the hand is restored to its normal position; (2) In the second group, the prognosis is fair, and the hand is restored to its normal position; (3) In the third group, the prognosis is poor, and the hand is restored to its normal position.

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that irritability to response, so that very strong currents are necessary to produce contraction. A good diagnostic point is the feebleness of response and the wormlike character of the contraction. In complete reaction of degeneration, the muscles will not react to the strongest faradic or galvanic current.

The normal reactions are K C C followed by

A C C
A O C
K O C

This reaction is different in degenerate muscles, A C C producing the greatest contraction, so that in the use of the galvanic current it is advisable for many reasons to place the anode on the paralyzed muscles.

Do not imagine that you are going to strengthen a muscle or a nerve by pouring electricity into it. Stress animates, strain destroys tissue.

The time spent in the application of an interrupted galvanic electric current (Interrupted 72 to 110 times per minute, synchronously with the pulse), should not exceed five minutes daily, using not over 10 milliamperes of current, or the least amount that will produce a reaction; it is advisable early to use the anode on the paralyzed muscle, while the cathode which should be of a very large size, is placed centrally. If the cathode is used upon the paralyzed muscle, it must be continuously moved in order to prevent an excoriation. Before the current is used upon the patient, the limb should be thoroughly heated and after being treated with electricity the part is massaged for from five to ten minutes; then the patient goes through a course of voluntary therapeutic exercises, mention of which was made before. This educational exercise, no doubt, has more therapeutical value in the spastic cases than any other method of treatment. It is also used in all forms of paralysis with much benefit, and as before mentioned the mental effort should be used by the patient at home, morning, noon, and night.

THE PRE-CANCEROUS STAGE.

Clinical observation has shown that the life history of most cancers shows alterations in the tissue antedating the development of malignancy, and the plain teaching follows that such alterations in known cancer sites should be attacked surgically before malignancy develops. Such a course would constitute an efficient cancer prophylaxis.—M. N. HADLEY, in *The Journal of the Indiana State Medical Association*.

STRAIGHT DIRECT LARYNGOSCOPY, BRONCHOSCOPY AND ESOPHAGOSCOPY.

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BALTIMORE, Md.

(Continued from March Number.)

The writer's method of direct laryngoscopy. The different steps of the examination will be described in detail because the method differs materially from all other methods with which the writer is familiar. The two essential points of difference are the tube which has been described above and the position of the head which in nearly every case is practically straight when the instrument is introduced. Long ago the writer became convinced that relaxation of the neck muscles was the most important point in successful tube work. He believed that if such a method could be devised, direct laryngoscopy would become more popular and thereby more useful. No one will deny that the extended position of the head is unnatural and that it must be more difficult for patient and operator with all the muscles contracted. The operator must overcome this unnatural position by pulling against muscles that are already straining. The position originated by the writer has been used by him in adults and children for more than four years and has proved eminently satisfactory from every standpoint. It is easy to learn and will prove satisfactory in every patient regardless of physical conditions.

The patient is seated on a low chair which has proven more satisfactory than a stool because of the straight back against which the patient leans. The head, reaching just above the back of the chair, in most cases is held perfectly straight and supported in the hands of a nurse. The nurse is instructed not to hold the head but simply to support it. The operator stands to the left or right of the patient according as he wishes to enter the mouth from the corresponding side of the mouth. The pharynx is anesthetized with the curved applicator, alpin being used for this purpose as was pointed out under the chapter on anesthesia. After waiting a minute or two the instrument described above is introduced with the left hand between the left or right bicuspid teeth while the patient is instruct-

into the larynx. The writer has made no measurements to learn the difference in the force used between the medial and lateral methods. But he knows from actual experience that it is much easier to pass his tube from the corner of the mouth with the head straight than between the incisor teeth. The photographs of the two positions will show the difference in the amount of force used better than any description. In any method of direct laryngoscopy, it is always well to pull the patient's lip up and out of the way of the tube for the pinching of the instrument may break up an orderly examination.

THE EXAMINATION OF THE LARYNX IN THE PRONE POSITION.

Under this heading will first be described the



Fig. 8. Direct laryngoscopy with the head bent far forward. The entire larynx is seen. It is a "freak" method never used in operative work. It shows that extension of the head is not necessary if a small tube is used.

methods under general anesthesia and then those which are practicable and useful with and without local anesthesia.

Mosher's method. In 1908 Mosher suggested a new method of examining the larynx and the upper end of the esophagus in his "left lateral route." So far as I know the method cannot be used without general anesthesia which is a disadvantage. The patient's head is turned to the left until the left cheek almost touches the plane of the table; the chin is then flexed on the chest. The operator sits on the left facing the patient's head and introduces the special spatula between the left bicuspid teeth, pushing the tongue to the opposite side. When the epiglottis is reached, it is hooked forward and the larynx is exposed. The instrument is used with an electric head light or with a light on the end of it. This method has not become popular because of the difficulties attending its use and be-

cause simpler methods have been devised. The position of the patient is awkward and it is difficult to learn to introduce the instrument quickly. It is more useful in upper esophagoscopy than in laryngoscopy.

Jackson's method. Dr. J. W. Boyce, working with Dr. Chevalier Jackson, has perfected a method of holding the head which is probably the best position, with the head extended over the end of the table. Jackson, in his book on tracheo-bronchoscopy, emphasizes the importance of having a trained assistant hold the head since it must be held just right if one is to work successfully. In this position the head and shoulders of the patient project over the end of the table; the assistant sits to the right of the operator with the right foot on



Fig. 9. Straight direct laryngoscopy with the ten millimetre tube introduced between the left bicuspid teeth. Adult male. Local anaesthesia. This position is rarely used because practically all adults can be successfully examined and operated upon in the sitting position with the head straight.

the floor and the left foot on a low stool while the left arm rests on the left leg and the head on the hands. The operator sits on a low stool and with the head in proper extension passes the laryngoscope between the incisor teeth. The epiglottis, coming into view, is lifted and the larynx exposed. There are several disadvantages connected with this method, *viz.*: it requires the services of a trained assistant which are easy to obtain if one works always in the same hospital or can carry his assistant with him. If, however, he cannot obtain his assistant, it is difficult to do successful work. The instrument is suspended in the air with the left hand the forearm tires rapidly so that it cannot be long held in the strained position. In the writer's earlier work he had a patient with a tumor of the left anterior cord which was impossible of removal in the sitting position because the throat would not tolerate the large instrument then in use. The

patient was given ether and an attempt made to remove the tumor with the head in the Boyce position. It was found impossible to move the gr with because it was too far forward to see clearly. The writer's experience probably accords with that of many laryngologists in the early days of direct laryngoscopy. The large size of the instrument and the position of the head were drawbacks impossible to overcome. In the above case the patient did not return because of the sore throat from the large instrument. Today that tumor could be removed in a few minutes with the improved laryngo-scope and the proper position of the head under local anesthesia. The cramped position of the operator on a

table kept for the child in extension. The operator stands at the foot of the table, turning the patient's head and introducing the laryngo-scope between the bicuspid teeth with the mouth wide. The head is then turned slightly to the right and the instrument pushed rapidly down to the epiglottis, which is looked forward and the larynx exposed. The writer has succeeded in examining the larynx with this method when it was not possible to do so in the sitting position. The only assistant needed in adults is someone to stand at the head of the table out of the way of the operator to steady the head. This method is seldom used except for purposes of demonstration. Nearly all patients can be



Fig. 10. Straight direct lying down. (Boyce, 1901) It passed between left bicuspid teeth. Gr. in position. Assistant not needed. Patient not held.

low stool is another of the main objections to the Boyce position, and lastly the fact of having the assistant in front of the operator is too small in convenience. After trying the position faithfully, the writer concluded that he would have to simplify the work or give it up as too difficult.

Brannings' method. The position of the head is practically the same as in the Jackson method except that Brannings' allows the head to fall over the leaf of the table which has been let down. He thus dispenses with an assistant to hold the head. In passing his instrument, it is held in practically the same way as the Jackson tube. In all these positions of the head, it is difficult to work without general anesthesia. In the method to be described, one can operate under local anesthesia if necessary.

The writer's method. The patient lies on the table with the head straight, or if the neck is shorter and thicker with some difficulty under the head of



Fig. 11. Direct laryngoscopy with the head in extension. (Boyce, 1901) It passed between left bicuspid teeth. Gr. in position. Assistant not needed. Patient not held.

examined under local anesthesia in the sitting position. The writer cannot imagine a condition in which it would be necessary to give a general anesthetic for direct laryngoscopy except in children above the age of six years.

Direct laryngoscopy in children. It is the field in which direct laryngoscopy has its greatest usefulness. Before its introduction, the larynx in children was one of the darkest, most inaccessible. The inability of most laryngologists to see the child's larynx was not due to lack of skill but to the natural difficulty to be seen. It is even under general anesthesia with the help of the complications of pulling the tongue out and removing secretion were so great that many were told a direct glottis could be seen only by direct laryngoscopy. The writer has seen the larynx of children under general anesthesia in the sitting position. The writer has seen the larynx of children under general anesthesia in the sitting position. The writer has seen the larynx of children under general anesthesia in the sitting position.

dren were hard to manage and results were far from satisfactory. Now, thanks to direct laryngoscopy, all this is changed and the treatment of diseases of the larynx has become an open book. Everyone must admit that direct examination is of more importance in children than in adults; but even greater difficulties are encountered as regards the size of instruments all of which are too large or too awkward in shape to expose the larynx quickly and easily. To see the child's larynx satisfactorily one must have a tube large enough to see and operate through, and at the same time small enough to be passed quickly without trauma. The

the straight position, devised by the writer more than four years ago and used continuously by him since. Mosher's method can be used in children if general anesthesia is used.

The writer's method of direct laryngoscopy with the patient sitting. This method can be used in children up to eight years of age. The patient is pinned in a sheet so that movements of the arms and legs are reduced to a minimum. A nurse or assistant holds the child in the lap with the legs between the knees. Another nurse holds the head straight. The operator, standing to the left, passes the tube between the bicuspid teeth, forces the



Fig. 12. Straight direct laryngoscopy. Ether anaesthesia. Instrument passed between incisor teeth. Boy 17 years old. Jackson's large separable speculum used preparatory to passing 9 millimetre bronchoscope which accounts for the fact that the head is not perfectly straight on the table.



Fig. 13. A particularly difficult case of small papilloma on the left vocal cord just at the anterior commissure. With the small tube, exposure and removal were comparatively easy.

instrument used by the writer has proven satisfactory in all cases during the past four years. It is the same tube which was described above as the most satisfactory in adults. It may be well to emphasize what was said about anesthesia under that chapter. The writer has not used anesthesia, either local or general, in the laryngeal work of children for four years. This statement refers to children under six years of age and he cannot think of a condition, operative or otherwise, which would compel its use. Anesthesia adds an element of risk which in the present state of knowledge, is not justifiable. Jackson, so far as I know, still uses the Boyce position in his work in children. The method of procedure does not differ from that described above except that he does not use anesthesia of any kind. The head is forcibly held over the end of the table during the examination or operation. While this position works fairly well, it cannot compare with

tongue to the opposite side, and when the epiglottis appears, hooks it forward with the spatula end of the instrument, and exposes the larynx. If necessary slight backward pressure may be made on the thyroid cartilage.

This method is described for the benefit of those who prefer to examine in the sitting position. The writer prefers the prone position because he thinks it is easier to control the patient. In this method the child is pinned in a sheet as above described and placed on the table with the head straight and steadied by a nurse, while a second nurse attends to the arms and legs. The operator stands to the left, facing the patient and passes the tube between the incisor or bicuspid teeth; he then pushes it rapidly down to the epiglottis, which is hooked forward or better upward and all parts of the larynx exposed. The examination, if one is at all expert, takes only a few seconds. This is an ideal method of examining the larynx in children because they

are under perfect control. One who has tried to examine the larynx with the head extended has been struck with its difficulties—it is almost impossible to keep the head still enough to introduce the tube; the position of the instrument suspended in the air is awkward and a great strain on the forearm while the operator is in a cramped position. Last, but by no means least, the position of the head and the instrument are unnatural, so to speak. The sitting position, while not so objectionable, is difficult enough on account of the struggles of the child. Contrast with these the position in which the head lies straight on the table; the nurse stands at

routine measure due to the multiplicity and the large size of the instruments. The writer is convinced of this from conversations with laryngologists all over this country. They say that they have invested in this or that instrument but that it is impossible to get a good view of the larynx. Some of them say that they have given up the work in disgust. This is a sad commentary on direct laryngoscopy which is one of the most useful procedures ever introduced into medicine. A short time ago a laryngologist from a neighboring state visited the writer's clinic to see direct laryngoscopy. He stated that he had just paid a big price for another laryngoscope which had proved unsatisfactory in that he had not been able to remove a tumor from the anterior part of the larynx because the

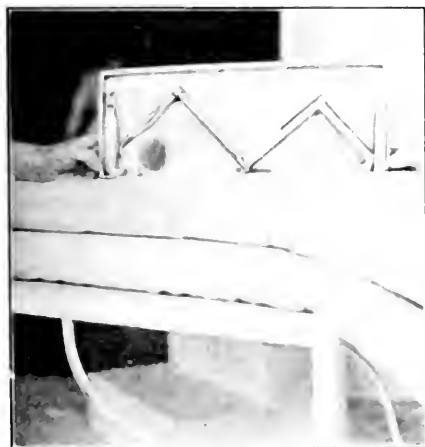


Fig. 14. Instruments used in laryngoscopy. On the left is the small modified Jackson handle with triangular frame. That the instrument can be used in the sitting position is demonstrated. To the right is the small separate instrument with triangular handle.

the head of the table to steady the head out of the way of the operator; the operator stands at the left in an easy attitude; in other words all the participants in the examination are in positions that are easy and free from strain. When one has tried both methods, no argument is needed to convince him of the superiority of the straight method.

In Brunnings' book the writer has looked in vain for any special method of direct laryngoscopy in children so it is fair to assume that he tried the same methods as in adult. Nothing as to anesthesia is found except the table of the percentage of general anesthetics used in Kulhan's clinic. He does refer to the operative cases in children as being the most difficult in direct laryngoscopy.

No such objection can be made to the straight method for with a little experience it is one of the easiest procedures in surgery. That direct laryngoscopy is not used by every laryngologist is a



Fig. 15. Direct laryngoscopy in a child. The head is held steady on the table.

large instrument had caused the patient so much pain from the pressure used to see the larynx. This man had studied under Von Eicken in Freiburg and had paid about \$30000 per lesson for instructions from him. He talked as if he were disgusted with direct laryngoscopy. The case with which the small modified tube was introduced and the larynx exposed to the anterior commissure made a profound impression upon him. To show him just what the possibilities of the instrument were, the patient's head was bent far forward with the neck brought as good a view of the larynx for operative or examining purposes as could be obtained. The De Zeng lamp, one could call it a torch, was used. When he insisted on an explanation of the method told him that it was the instrument, not the skill of the operator or the operator. When he asked how that he would introduce the laryngoscope, the writer explained to him the proper method of introduction.

siders by the small tube. Recently Mueller has made two tubes for the writer measuring respectively 18 and 14 centimetres in length and 10 millimetres in the inside diameter for use with the Brunings electroscope. They are easily introduced but the writer prefers the modified Jackson tube for reasons stated above.

Comparison between direct and indirect laryngoscopy. It cannot be denied that one can see lesions better through the direct laryngoscope than with the mirror or the pharyngoscope. But for ordinary office work it is better to use the mirror or the pharyngoscope because they do not take as much time. One who is expert with the mirror can usually make a diagnosis with little difficulty. In a few cases with a low hanging epiglottis and a large uvula, great difficulty may be experienced in getting even a glimpse of the larynx; in these cases the pharyngoscope usually fails us also. The main objection to the pharyngoscope is the distorted and unnatural image that any prismatic instrument gives. In children the writer never resorts to the pharyngoscope but examines with the direct laryngoscope at once so that, if an operation is necessary, it can be done immediately. If the mirror fails, it is the proper thing to resort to direct laryngoscopy at once; if, with the mirror, uncertainty as to diagnosis prevails, the direct method is used to get a better view of the larynx. A patient came to the writer some months ago with aphonia. Because of a low hanging epiglottis and an unusually sensitive pharynx, it was not possible to get a view of the vocal cords. Even after the use of cocaine the larynx could not be seen. With the small tube the larynx was examined directly and a diagnosis promptly made. To sum up it may be said that the mirror is the instrument of choice in routine office work; that in those cases in which the mirror or the pharyngoscope fails, the examination can be successfully made with the direct instrument; that in children it is a waste of time to try the mirror or the pharyngoscope because the examination by the direct method is quickly made and the operation, if necessary, can be performed at the same sitting. For all operative procedures in the larynx, the direct should always be preferred to the indirect method because one can see so much better what he is doing. For operations in the anterior commissure, the mirror has an element of uncertainty which makes its dangerous.

Mistakes in passing the direct laryngoscope. The most common mistake in passing the tube is probably pushing the spatula end of the instrument too far down back of the larynx. The patient immediately begins to choke and

to make attempts to pull the instrument out. The mistake should be rectified by gently pulling the tube up until the arytenoids appear when the epiglottis is pulled forward. This mistake is more apt to happen with a large than with a small tube because with the large tube the muscles are on the stretch which makes orientation more difficult. With the small tube, passed slowly, it is practically impossible to miss the epiglottis and arytenoids. Another mistake by beginners is the attempt to pass the tube too rapidly. Direct laryngoscopy should be done slowly and carefully especially if it is the patient's first experience. The writer thinks that one of the greatest mistakes is the use of a large instrument which always requires more or less pressure on the tongue and gums. One difficulty which all laryngoscopists have to deal with occasionally is the choking sensation experienced by the patient; this can usually be overcome by gentle manipulation of the instrument and reassuring the patient that by breathing quietly nothing can happen. The writer has never had this difficulty since he has been using the small tube. In former days with the large instrument it was a common occurrence. The advice that Brunings gives to give up the examination if the throat is very irritable and to instruct the patient to return the next day is not necessary with the use of the small tube. The writer has never seen a patient who could not be successfully examined at the first attempt with the straight position of the head and the use of the small tube provided the patient is not the victim of some chronic nervous disease such as chorea, etc.

(To be continued.)

HAND INFECTIONS.

To deal with hand infections successfully with the preservation of the greatest functional results, one must have a very definite mental picture of the anatomy of the part. It matters little whether you can name the structures, provided you know the function of the various structures and their relative positions. In infections, the most essential anatomical structures are the various tendons and their synovial sheaths. The tendons, because if they are destroyed or left fused together, movement in the parts supplied by them ceases. The synovial sheaths, because by their presence infections are easily disseminated and their effects rendered more disastrous. The lymphatics, which in the forearm and arm play so important a rôle in the spread of infections in those localities, may be disregarded in considering the spread and treatment of hand infections.—IRVING S. HAYNES, in the *N. Y. Medical Journal*.

The adhesions found in the lateral fossæ, the semi-atrophic areas sometimes found in the vault of the epipharynx with the resulting interference with the pharyngeal end of the Eustachian tube, in patients operated upon by our most skillful throat surgeons, make us stop to question. While we are studying this subject we can easily become pessimistic and be led so far toward the side of no surgical interference as not to be conservative. It is not the purpose of this paper to court pessimism but to present some facts which will show that we are but beginning to learn the rudiments of the subject which has been so studied, hashed and rehashed for nearly 30 years.

Were it not for cicatrices and their effect upon the Eustachian tube the subject of adenoids would be of little importance for, with our present knowledge, the immediate resulting effects of the adenoid operations are very rarely bad and frequently the individual is improved in many respects. The results are so excellent in many severe cases that the physician of moderate training and ability as well as the guardian of the child is frequently led to think of an adenoid operation for all the ills of childhood from indigestion to enuresis. During the past few years it has become the pastime of the mediocre family physician to advise and try to perform an adenoid operation upon every child who shows any symptoms of ill-health. In many cases little is accomplished or little trauma produced but often the walls of the lateral fossa are injured, and I have even seen the mucous membrane and also the cellular tissue removed to such an extent as to bare the bone in epipharyngeal vault.

The unskilled work in the epipharynx does not concern us so much here; but the work performed by our school physician and nurses, complemented by the hospital out-patient clinic, does. The school children in our cities are referred by the young school physician and conducted in droves by the school nurses to the various clinics and we, as a rule, are prone to give them a quick glance and then pass them on to the young interne or assistant surgeon for operation. I believe in this manner we are committing one of the greatest medical crimes of this generation for a large percentage of the children not only do not need an operation in the epipharynx but would be far better off without it. Under the usual methods of examination, it is easier for the overworked men in the clinic to pass on to the operating room these cases than to carefully examine them and disagree with the school physician; but I believe we should select all doubtful cases and have two or three men

in the clinic pass upon them and then, if thought best, refer them back to the school physician stating at time of examination we did not deem operation advisable but would like to again examine the patient if symptoms should ever arise suggesting naso-pharyngeal disturbances.

There can probably be no cause for discussion concerning the advisability of removing a large central adenoid mass which hinders respiration or presses upon the cushion or overlies the pharyngeal orifice of the tube but in these cases great care should be used so as to avoid injuring the cushion of the tube while removing the adenoid tissue; and our whole duty has not ended with the operation, however skillfully performed. These patients should be examined within a few weeks after the operation to learn if there has been healing without adhesion or other deformity. If we can impress the advisability of this examination upon the guardian of the patient as well as upon the medical profession in general we shall have done much to protect our patients against evil or unsatisfactory results which sometimes follow the operation for the removal of adenoid hypertrophy.

One of the reasons for presenting this subject is to ask have our methods of examination in the past been such as to enable us to so carefully diagnose the conditions in the epipharynx as to tell what cases need surgical interference and what cases will best be cared for by other means? In marked cases we can say yes, but in a large number of cases we must say *no*.

With the naso-pharyngoscope it is possible in the majority of children over 4 years of age to inspect the epipharynx while at rest and during the act of deglutition. This has been of great assistance and satisfaction to me in all these cases where the nasal passage was sufficiently large and the child was under control, but in younger children and in those who are timid and cannot be controlled, it is frequently difficult and sometimes impossible to pass the instrument through the nose. The epipharyngeal space is small and digital examination is frequently misleading even with a long slim finger. In these cases it is usually impossible to satisfactorily examine with a post-nasal mirror, for the child in resistance and crying closes the pharynx from the epipharynx. I have been very anxious to examine these little patients as I could older ones for the knowledge gained by vision is usually much more definite than that of speculation or even that of palpation. Last Spring I devised a tubular speculum which can be slipped behind the soft palate and, by sliding the retractor, will carry the soft parts

cise in any case. We must not coddle them too much nor should we make them too apprehensive of trouble every time they happen to be exposed to draughts or dampness. We must try to gradually harden them to exposure but nothing is gained if we carry our hardening methods beyond a point followed by healthy reaction. In the anemic and frail child who is very prone to frequent and often severe attacks of epipharyngeal inflammation as well as in those who suffer from a chronic condition, the syrup of the iodide of iron is often of considerable service.

The infections of the epipharynx being almost always associated with similar infections of the nose and frequently associated with like oro-pharyngeal infections often demand treatment simultaneously with these adjacent cavities. In epipharyngeal infections, as aural complications are frequently of great importance it is essential that early treatment be applied which may prevent severe aural extension. In the early stages of congestion of the nose and epipharynx the patient, if possible, should be placed in a room with plenty of warm, moist air. A small dose of Dover's powder with some hot drink often aids by stimulating the skin to greater activity. A saline or a dose of oil is advisable especially when the child is inclined to be constipated. In young children we must generally advise against the use of douches even when there is hypersecretion, as there may be more danger of injuring the Eustachian tube and ear than of protecting them against the advances of the infection. Steam with the vapor from tincture of benzoin may be of service. A spray of benzoin and resorcin is often efficacious. Heat applied to the sides of the neck near the maxillary angle is of marked service in allaying many of the acute epipharyngeal congestions. Often very satisfactory results can be obtained by applying to the nose anteriorly an ointment of hydrastin muriate gr. 3, menthol and eucalyptol, aa gr. 7, and lanoline oz. 1. Only a small amount of this ointment should be applied at one time and three applications are sufficient for a day. A 10% to 20% solution of argyrol applied to the epipharynx either by the Eustachian syringe or by dropping through the nose has been found to produce very satisfactory results in a large number of these cases. Where these inflammations are accompanied by marked swelling and with extension into the tube and ear and where there is complete blocking of the tube with the resulting middle ear inflammation whether or not there is secretion within the middle ear and bulging of the membrana tympani quick relief of the ear condition can usually

be obtained by injecting a solution of cocaine and adrenaline into the Eustachian tube and following this after a few minutes with an injection of argyrol. In young children or in older children who rebel against treatment we sometimes find it hard to use the Eustachian syringe. In these cases the patient's head can be held in Rose's position and tilted toward the affected ear and the solutions can be dropped through the nose and allowed to flow toward the orifice of the tube. It is much more satisfactory where possible to use the syringe under the guidance of vision. This is true in regard to all treatment of the epipharynx especially when working about the orifice of the Eustachian tube.

Chronic epipharyngeal inflammation may produce a simple hypertrophy with or without purulent secretion or may go on to atrophy of the mucous membrane and to the underlying structures. Except in the after results of severe epipharyngeal diphtheria it is very rare to find an atrophy of the mucous membrane in young children. The chronic inflammations are frequently associated with or due to septic nasal inflammations. In chronic epipharyngeal inflammation even in young children we must never forget syphilis as a possible etiologic factor. Chronic purulent epipharyngitis in young children is often very hard to treat. It is frequently the result of a chronic purulent condition somewhere within the nose which it is impossible to definitely locate.

In all our work within the epipharynx whether for exploration or treatment we must use great care for the mucous membrane of this area, especially that covering the Eustachian tube, will not stand harsh treatment and much injury may follow careless treatment. In cases where it is necessary to remove bands or growths in the lateral fossa or to treat any pathological conditions about the orifice of the Eustachian tube it is possible to proceed with greater precision when the operative field is under vision. This is accomplished when possible by passing an endoscope through the opposite side of the nose and the operative instruments through the same side as the lesion to be attacked. Dr. Yankauer has demonstrated the direct method of attack through his direct speculum. In a recent paper Dr. Beck has described a method of operating upon the epipharynx under direct vision. He passes a rubber tube through both nostrils and then carries the ends through the mouth. By applying traction he lifts the soft palate forward. I have not had sufficient experience with this method to pass judgment upon it, but thus far I have been unable to view the cushion of the tube or the lateral

fossa. In very young children it is frequently impossible to operate upon or treat the epipharynx under vision by the aid of the endoscope. The nasal passages are frequently too small and it is impossible to keep the patient sufficiently still. I am of the opinion this is also true with Dr. Yankauer's tube. I am trying in these cases to pass the curette and forceps by the side of the palate retractor and then use them in the epipharynx under the guidance of the scope passed through the tube of the retractor. As yet I have not developed a sufficiently positive technic to be able to proceed quickly and accurately but I hope and believe it will be possible to accomplish this in time. It is fortunate that in the very young child and in other children who have not been subjected to trauma it is rare that we find adhesions in the fossa or a demand for surgical treatment for the existing nasal disease.

What we most need at present is more proficiency in examining the epipharynx, especially in children, and more conservatism in treating the pathological conditions found in this space. In order to fulfil these demands it is imperative that we take a wide and comprehensive view of every case before deciding upon the best course to pursue, keeping always in mind that the important object is to prevent aural disease and to relieve as far as possible any existing pathological conditions within the ear.

THE ETIOLOGY, PATHOLOGY AND TREATMENT OF PHLEBITIS.

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(Continued from the March issue)

MICROSCOPICALLY.

Acute Phlebitis. Taking a cross-section of a vein in an acutely inflamed condition we find the following condition: the entire field seems infiltrated with red blood and white blood cells; the endothelial layer of the intima has become very much flattened or stretched, each endothelial cell seeming very thin, this thinness varying in different localities. Beneath this endothelium we find that one bundle of thin muscle fibers is separated from another to a marked degree. The individual small bundles seem to take the stain poorly and there is much brown, granular debris within and between the muscular meshwork. The underlying thin, white fibrous layer does not look so markedly changed except for the infiltration with blood cells and serum. The middle layer of the artery, in the circular arrangement of the muscular fibers, is

usually fairly good but even a bundle of these fibers might cut off under high pressure. The circular fibers are flattened out and flat while they are well infiltrated with brown granular material or deep reddish granules. In fact this granular material seems very predominant and is of extreme importance because of its dependence for work upon what muscular fibers there is left. All of the muscular fibers are thin, taking the acid stain poorly and breaking at most dependent constricting points. Here and there we find that the muscular fibers fail to stain to any degree and that atrophy is a marked feature.

The adventitia shows a number of changes very characteristic of this condition. The inner layer of the adventitia shows much granular degeneration or the longitudinal muscle fibers. Fairly well colored dark brown granules are thickly scattered within the muscle itself. The muscle fibers are very thin, taking the acid stain poorly while in places the stain is wanting. Atrophy is a predominating feature and the minute fibers seem stretched to a fine thread. An occasional minute blood vessel, over-distended, and filled with red blood cells is seen within this muscular coating. This blood within the lumen will show various stages in fully organized clots, semi-organized clots and again quite normal with less crowding by the cellular blood elements and more fluid or serum.

The connective tissue of the adventitia is mostly of white fibrous tissue. In fact the white fibrous tissue is the most predominating factor at this point. There is much infiltration of the fibrous substance, red blood, and white blood cells being plentiful. The various strands of the tissue are separated by this infiltration and much serum gives the whole area a depreciated value. The connective tissue takes a pale green or pearly white color and the individual fibers by a very low retractive power show much weakness. Fine granules are present everywhere.

Now and then we come across a larger or smaller blood vessel. Some of these vessels are entirely empty, strange as that may seem. On the other hand many of these little vessels are overcrowded with red blood cells. In some of the vessels there are larger or smaller interposed between the red blood cells upon the following points to be present in different amount. Some of the vessels contain well organized blood clots and here and there are the cells rearranged.

Near the periphery of the adventitia will be seen a few small arterioles ending in a few red cells and a few granular cells. These are found

overworked condition in which they are. The nerve substance is cloudy and fails to take a clear stain. This would serve to bear out my hypothesis as to the cause of pain from phlebitis.

On the whole, we find the lumen of all the involved veins very much distended. They are crowded with red blood cells; some having the inter-spaces between the colonized groups of red cells filled with serum. Great numbers of these lumina contain well organized blood clots which take a deep brown or bright reddish brown stain. Now and then we find a semi-organized clot. Under these circumstances, the red cells are much crenated and the white cells very granular, many having lost their nuclei.

Looking over many fields of these veins I find that at times the entire vein wall seems much conglomerated and granular throughout. The acid stain, under these conditions, takes best within the innermost margins of the wall outside of which are found the pale yellow or brown stain encased within a margin of pale pink. Under the 1/6 projective it is at times very hard to find any beginning or end of the vein formation. The veins under such circumstances are simply designated by exclusion in comparison with the surrounding structures. This condition seems to be most constant in those cases where the disease is of long standing or fulminating from the start.

While examining a number of sections made in the long axis of the involved vessels, I found well organized clots of varying lengths completely occluding the vessels and very adherent to the vessel walls. Under dissection for gross specimens to be used in section work, I found these clots in length from one inch to two and a half feet, depending upon the size of the vessel in question. I recall a case where the thrombus completely occluded the tibial, popliteal and femoral veins for their entire length. This followed pneumonia in a little boy with a natural fatal ending. This case is not included in this series of statistics, however, as it occurred since the compilation was completed. Nevertheless it is very interesting and provides a formidable example of what may be possible in the extension of thrombosis.

Suppurative Phlebitis. Under this heading we are dealing directly with an infective condition; in other words the condition is one which is very apt to spread more or less rapidly, limited only by the conservative powers of the individual in question. Not only is the vein itself involved but the supporting structures surrounding the vessel are also much infiltrated with pus and lymph. Macroscopically we find all parts much thickened and

necrosis is a prominent factor. Here and there are minute pustules of *greater* or less capacity; shreds of lymph adhere to all the surrounding structures and the veins themselves are completely occluded by a mass of pus, blood and lymph. The entire structure is very friable, is easily punctured with a blunt instrument and will not retain sutures and, when cut, leaves material adherent to the knife blade, while studs of lymph and fibrin are plentiful.

Microscopically, a cross-section of this vein shows the mural structures to be more or less indistinct as far as individual layers are concerned. Each layer appears well glued to its neighbor and the walls assume the appearance of a mass of fibrous tissue undergoing necrosis and at the same time are markedly infiltrated with white blood cells and fibrin. The mural layers take the acid stain very poorly, yellow and brownish fields being more abundant but not marked by brilliancy. Everywhere can be found polynuclear leucocytes taking the alkaline



Fig. 8. Femoral vein $\times 100$ into which culture of *B. Coli communis* has been injected, Guinea pig. Note mural leucocytosis, perivascular hemorrhage and small round cell infiltration of vessel wall. At the free border of the thrombus a suggestion of separation of the intima is seen.

stain unusually well and giving the whole field an appearance of spotted blue. The lumen of the vessel is entirely occluded with a material containing only a few red cells, many white cells and much fibrin. This pus clot is firmly adhered to the periphery of the channel and has a soft appearance. The supporting structures surrounding the vein are undergoing a coagulation- and degenerative-necrosis assuming likeness to death en masse. Many well-stained polynuclear cells are found all through this tissue and shreds of fibrin are very plentiful. Many areas reflect a black unrecognizable mass of dead material. Few of the muscular striations are brought out well while atrophy through the channel of sudden necrosis is most important. Minute collections of pocketed pus cells can be seen every-

where, some of which have burst spontaneously while many others are intact.

Chronic Phlebitis. Here we meet the tortuous, calcified, over-distended veins of a long standing ailment. Grossly the veins can be seen beneath the skin, snake like, winding and unwieldy. To tactile sense they feel like knotted string or rope and at times can be easily rolled beneath the finger ball. Here and there will be felt larger or smaller areas that seem more resistant than the other parts and have a scratchy tendency.

Cutting across a section we find that the knife blade remains practically clean. As pressure is brought to bear upon the blade certain gritty areas will be felt as they are cut through. If these areas are scraped with a knife, a gritty material is freed, which feels like sand when rolled between the finger tips. The venous channels are left gaping and empty, except for an occasional small stringy clot. The elasticity of the vein wall is absent and the ends point, while the venous walls are thickened to a marked degree. The surrounding, supporting, soft structures are not markedly altered. The muscular and fibrous structures seem to be in good condition so far as a relative value is concerned. These soft structures cut easily and leave a clean knife blade behind.

Microscopically, a cross-section will show the veins to be practically empty. Here and there an occasional vessel is seen partly filled with blood, but this is not common. One very noticeable thing is the absence of intima reduplication acting as valves for column support. In nearly all of the specimens examined this was so. The endothelium of this intima was very flat, shining and glistening, and in many of the sections examined, there were seen larger or smaller areas taking the pale stain of calcified tissue. However, numbers of the section showed none of this calcified deposit. The lumen of all the veins seemed large as if it had been over-capacitated for some time. The basement structure of the intima was thin and did not take either stain well. The media showed in many sections a tendency toward increase in muscle fiber elements. Again there would be fields where the muscle bundles were small, taking the acid stain poorly and showing evidence of atrophy. Calcified areas were found deposited in the muscle bundles of many fields. This, however, was not a constant factor, and in many instances it was wanting. The adventitia of many fields appeared normal and took the stain fairly well. The scant muscle bundles were absent in many instances where they might be expected to be found. Other sections showed the

white fibrous structure to be overdeveloped or hyperplastic. Again we found that this fibrous structure was very much thinned and took the stain very slowly. This portion of the venous structure was not by any means free from alined areas. The supporting, soft structures did not vary greatly from the normal except for patches of calcareous deposit. These parts stained well and seemed fairly healthy.

Longitudinal sections from the same specimens showed very tortuous courses in the veins. They would appear and disappear alternately for some distance. One thing was prominent in the longitudinal section work, namely, the presence of more blood in the veins. Small clots were seen here and there although they did not always over-distend the vessel.

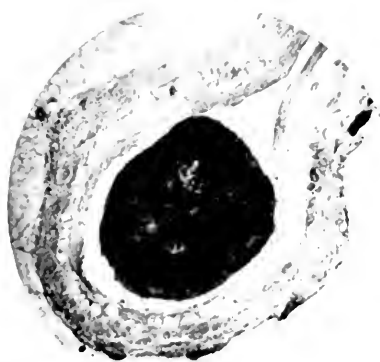


FIG. 1. Phlebitis. Cross-section of vein showing thickened wall and irregular lumen.

TREATMENT

In treating phlebitis cases certain general rules can be carried out in every instance and again other things have to be considered according to the location and the part involved. We must also consider the individual himself. For the present we shall consider only the aortic forms of phlebitis and their treatment will be covered under the three headings just outlined.

All phlebitis cases, so far as treatment is concerned, can be summed up in two words, "rest" and "following such, the result, more or less, will be, "repair," permanent or temporary. General hygienic rule should be adhered to, especially in every case. Here, as with all other pathological conditions, fresh air, proper diet, and the elimination of bad habits, such as smoking, are of great importance. For the external, proper bandaging and the use of

light and suggestive influence resulting in established confidence, all play their important parts.

A feeling of well being should be encouraged at all times. All phlebitis cases are slow in recovering and to keep the general mental tone high is to encourage more rapid recovery. The entire body should be bathed daily with alcohol and water supplemented with a soap-suds cleansing twice a week. Following such a bath the skin should be well frictionized, thus increasing the superficial circulation and drawing away from the point of disease as much as possible. One rule is always to be applied, *i. e.*, never frictionize over the area of disease but draw the blood elsewhere thus allowing the diseased area to remain at rest.

The bed clothing should be light but warm. This class of cases seems to do better in linen sheets with light all-wool blankets for the top covering. Any discomfort from heavy clothing weighing down upon the diseased area, should be avoided. The diseased part can be protected by a cradle or other improvised frame for holding up the bed clothing. Flannel night dresses serve best to come next to the skin. If any underclothing is worn in bed (it is far better not to wear any), it should be of the silk-wool variety with very fine texture.

Heliotherapy plays an important rôle in this disease. If possible, expose the involved part to the direct sunlight for at least one hour daily. All cases seem to have a shortened convalescence by following out this rule. In fact, if the patient could recline in a solarium during all of the day the entire system would benefit much by the exposure. In addition, the part for special attention could be exposed by removing the covering for the one hour needed during the period of maximum sunshine. Patients will do better in a well ventilated room by themselves than in a ward. The room temperature should never be above 65°, and free circulation should be established.

The alimentary tract should be very closely watched in order that the bowels may move twice in each twenty-four hours. If they will not do so naturally, a mild cathartic should be given. Three times a week a high enema should be given that the entire intestinal tract may remain clean. Of course, where local intestinal trouble is present, as in typhoid fever, or in cases where for other well-founded reasons such disturbance is bad, this procedure should be omitted. In general, however, this rule for cleansing should be followed. Plain suds and water, two quarts in amount, never forced, seems to do the work best. Under no circumstances should the bowels be allowed to become constipated.

The diet should be carefully supervised from day to day. In typhoid cases this needs special care, as also when other abdominal viscera are involved. Whenever the veins of a serous cavity are involved, especially when that cavity is the abdominal, the closest care, as to diet, should be taken. In those not suppurative, the nourishment should be liquid and that well selected. The broths and soups should be strained, the fruit juices should not contain any pulp, the milk should be diluted with water and the proper amount of lime water added. Thus it will be seen that only a liquid diet is permissible. The heavier and full strength liquids are not easily digested. Any nourishment forming large curds in the stomach should be excluded. Water should be given very freely and the patient should be encouraged, coaxed or even gently forced, to take more than the amount to which he is accustomed.

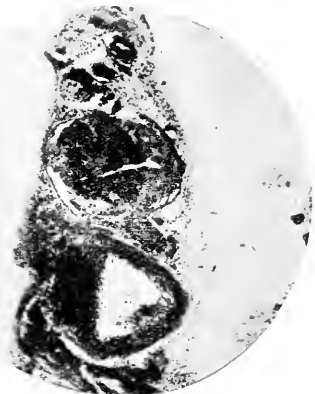


Fig. 10. Vessels of groin of Guinea pig into which alcohol has been injected. There is thrombus of the femoral and smaller veins. The artery as usual escapes.

When suppurative is present as a complication of the venous condition within a serous cavity, far better results are obtained if the patient be Ochsnerized. Everything except water is withheld for intervals varying from three days to a week. This rule should be closely adhered to, if the best results are to be obtained. In all internal suppurative conditions the general system is undergoing a continuous shock, so that any extra burden in the form of food does more harm than good and merely adds to the work of the functions already overtaxed.

After the critical points are passed and reactionary resistance comes forward, we can begin to give nourishment. Only the most easily cared for liquids should be given at first; as malted milk, albumen water, orangeade, grapefruitade, lemonade and plenty of water. Guided by the care the patients

take of this amount of nourishment, it should be gradually increased to a full liquid diet. I have found that egg-nogs, raw eggs and malted milk egg-nogs serve to aid in these cases at this time.

Gradually a semi-solid diet is begun while the milk, eggs, egg-nogs, plain and with malted milk are continued. If this diet is well received the full house diet can be given and from this moment on rapid advances toward recovery are made. Each case should have his individual immunity well established before forced feeding is commenced.

The general systemic treatment can be classified under two heads; namely, superficial and deep.

SUPERFICIAL TREATMENT.

Under this heading the acute and chronic phlebitis cases are to be considered.

Acute Cases.—Here we have to consider a condition very prone to extension, more or less rapid and at times extremely liable to thrombosis. Two things we desire to accomplish, one being limitation of the disease, the other prevention of occlusion of the vein or veins involved. To accomplish these ends the part should be kept elevated.

Let us take as an illustration the involvement of the veins of the lower extremity. The limb should be elevated upon a well padded inclined plane at an angle of forty-five degrees. By so doing the blood is allowed to drain back into the larger channels and thus prevent extreme stasis, and thrombosis is far less apt to occur. Swelling is kept at a minimum and the skin maintains good nourishment, elasticity and tone. The member should be carefully wrapped in sheet wadding or absorbent cotton held in place by very light gauze bandaging. The limb is then placed in a comfortable pillow cradle resting upon the inclined plane while a good position should be maintained by keeping the toes up, the foot held at right angles to the limb and the heel supported so that no extra pressure will come upon it. Under no circumstances should the part be massaged, and rough handling and jerky movements should be avoided. It is a good plan to bathe the skin with an alcoholic solution, using a soft sponge and avoiding rubbing. Dry the skin by fanning and then dust with talcum powder. Occasionally the powder can be omitted and olive oil used to gently bathe the skin surface. The whole dressing should be continuously heated by hot water bottle so adjusted as to bear no weight upon the part. The temperature of the dressing should be evenly maintained at 110° to 115°, day and night. Once each twenty-four hours all the dressing should be carefully removed and the member inspected.

Now and then we meet with ulceration of the skin as a result of the action of the involved vein. This may result about in two ways, either by rupture of the vein or by infection. In either case hot bichloride or mercury fomentations should be applied and these should be changed frequently in order to be kept moist and hot, preventing adherence of the gauze mesh to the raw area. A week of this treatment will so antisepticize the area that the fomentations can be omitted, the area allowed to desiccate and a dry dusting powder applied. When treating these cases the warm covering should not be disturbed. On the contrary, it should be windowed over the special area to be treated so that ready access to the ulcerated part is obtainable while the dry dressing as a whole is not disturbed. After the dusting powder treatment is begun the ulcerated area should be daily cleansed with subli-



Fig. 1. The limb is kept elevated upon the inclined plane at an angle of forty-five degrees. The dressing is changed frequently and the part is kept moist and hot.

mate solution, allowed to dry by the influence of the air, and then redusted. The dusting powders giving the best results are oxide of zinc, stearate of zinc, coarsely pulverized and not allowed to cake, subgallate of bismuth, and the like. We will have our choice of dusting powders and they each seem to serve their purpose well. Fortunately, the condition in the acute form is not frequent.

Chronic Cases. Under this head we meet the anastomotic type of cases found in those who do hard labor, requiring much standing, and usually the cases must be treated as permanent, and they have to keep on working in order to continue to support their families. If we are confronted with a condition which requires careful supervision and explicit, detailed direction, we are dealing with the large, stubborn, superficial cases, treated by windowing and by continuous support.

First of all, we must test the ability of these veins to empty themselves. This is done by having the patient lie down, elevate the lower limb or arm, as the case may be, and by careful digital milking endeavor to empty the tortuous channel. If this procedure succeeds, the case seems more likely to be amenable to a trial without operative procedure, for the time being at least. The patient is then instructed to elevate the disrobed member at an angle of 45° for from ten to thirty minutes daily. He can do this during or following a meal, thus not intruding upon his working hours. A properly outlined or close fitting elastic or linen fiber stocking is to be worn continuously while at work. Whenever the limb be elevated for rest and drainage this stocking should be removed.

The patient should be thoroughly instructed as to the proper care of the skin, which should be bathed thrice daily with an alcoholic solution without using the skin roughly. A soft sponge should be used for this purpose and the skin surface stroked in the direction of the venous flow. After bathing, the skin should be dried by fanning and talcum powder is to be dusted over it. We should always caution the patient against undue roughness and that special care should be taken not to engage in scuffling or lifting heavy weights.

The patient should improvise an inclined plane cradle, properly padded, in which the affected member may rest during the night. Often elevating the foot of the bed eighteen inches will serve the purpose very well; in order to counteract discomfort of the upper body the upper half of the mattress can be propped up with padding or an extra pillow or two provided. In this way the part will be put at complete rest during the sleeping hours and pain, fulness and itching are largely prevented from developing. The stocking should always be removed during sleep, to be reapplied, after properly bathing the part, the first thing in the morning. The patient should be made to understand that this is very important.

When a desirable change of occupation can be made without lowering the income of the patient such a change should be advised. Often such a change as that as will provide the rest portion is beneficial even though the physical labor be quite as hard.

Chronic phlebitis cases are materially benefited by local alternate hot and cold spray, douching, packs or submersions. One of these four methods can be used according to the conveniences of the patient, for they give like results. The submersion and spray combined are often the most convenient and are to be carried out as follows.

Two tubs or pails are used, each containing enough water so that when the affected extremity is submerged, it will cover, if possible, the entire field of tortuous veins. One pail contains water drawn from the cold water tap (or if it be in hot weather a piece of ice should be added in order that the water may be very cold); the other pail contains water at a temperature of 110°. The affected member is first submerged in the hot water and held there thirty seconds. It is then submerged in the cold water for fifteen seconds. This alternating procedure is gone through ten times, ending with the cold water submersion. The part is then gently rubbed until the skin is dry and red, showing proper reaction. Gentle stroke massage in the direction of venous flow is carried out for ten minutes, the skin is dusted with talcum powder and the



Fig. 12. Preparation from case of thrombosis occurring during hernia operation. There is a dense perivascular coagulum and a thrombus is firmly adherent to the intima of the vessel. It is somewhat contracted, due to the reagents used in preparing the section.

member is properly clothed after the elastic support is applied.

Where it is not feasible to use the submersion method, spraying with sponges of hot and cold water, or a nozzle spray attachment serves the purpose very well and is applied for the same length of time. In fact, even when the submersion method is used the spray is often employed to supplement it by treating the upper parts or fields that cannot be submerged.

When none of these methods can be carried out the hot and cold packs for the same periods serve well. Heavy turkish towels are used, wrung out in water of alternating extreme temperatures. The main purpose is to obtain an alternate application of heat and cold extremes for the desired length of time. By such treatment the vasomotor nervous system and sympathetic bloodvessel innervation sys-

If the case be one of acute septic infection or auto-intoxication, the diet should be restricted to a marked degree; in fact, I believe that Ochsnerizing these cases gives best results, giving nothing but water in large amounts, hot or cold as desired. This should be followed out for from four days to a week. If the broad ligament veins are involved Fowler's position is to be used, the patient lying flat upon the mattress with the head of the bed elevated for eighteen inches. The foot-board should be placed so that the patient can rest comfortably with the feet against something soft, as a pillow. It is best to keep the patient flat upon her back and caution her not to move much; also the nurse should be especially cautioned not to allow the patient to move hurriedly and that she should not handle the patient except with much care. A cradle should support the bed clothing, thus preventing any undue pressure upon the abdominal wall. Ice caps should be applied over the lower abdomen if the skin surface is protected by some soft material, as a turkish towel, which will act as a pleasant intermediary beneath the cold application. As long as the temperature remains above 100° these cold applications should be continued, but whenever the temperature is above 102° , a fever bath should be given every three hours.

I insist on two or three things in particular when these temperature baths are given; namely, all the water, containing the proper proportion of alcohol, should be at 95° , a single part should be bathed or sponged separately, that is one arm should be bathed, rubbed dry and then frictioned with the palms of the hand; all rubbing and frictioning should be done upward toward the body. After this arm is properly cared for the opposite arm should be treated in the same way and covered. Before another part is bathed, the part just treated should always be covered. Next the face neck and shoulders are bathed in the same manner. Next in order, come the chest, upper back, lower back and abdomen. The back should be rubbed up and down and across between the scapulae. The abdomen should be rubbed very gently in a circular motion, right to left, with the umbilicus as a center, or if it be too tender not bathed at all. Next in order come the lower extremities, which are bathed separately. After the bathing each part, in the order named, should be carefully frictioned with the palms of the hands. This is most important as the superficial circulation becomes increased and the skin flushed. I believe that this increase of superficial circulation has much to do with cooling the body interior by radiation of heat from the body surface. I also believe this lowers the temperature

quite as much as the cold bathing and the treatment would not be complete without this increase of superficial circulation. The temperature should be recorded just before and immediately after the bath.

At the end of four days to a week, as the temperature gets to 100° or lower, feeding should be begun, first by giving limited liquids, then gradually increasing in the usual manner. A daily high suds enema should be given throughout the course of the disease and the alimentary tract is to be kept clean. The twenty-four hour amount of urine excreted should be kept and a uranalysis made daily. The patient's bed should never be put down on a level until the temperature has been normal for three days.

Vaginal douches of bichloride of mercury (1-2000) at a temperature of 110° , if given twice daily, aid much in alleviating this condition, and no one thing does more good in phlebitis of the broad ligament. These douches should be continued for one week after the temperature has come down to the normal line and remained there.

Whenever there is membrane left in utero this should be removed with a dull curette while a sharp curette should never be used under any circumstances. After the curettage, a hot intrauterine douche of sterile water (temperature 115°) should be given. Occasionally a boric acid solution may be used, but sterile water serves the purpose quite as well. The intrauterine douche should not be repeated unless there be further evidence of continued absorption. Where such is evident it should be given once daily for a week or so. Convalescence should be very slowly progressive with the patient remaining in bed for three weeks after the temperature has fallen to normal. Slow advancement is to be insisted upon.

When hepatic cirrhosis is the active principle behind the involvement of the veins in the upper abdomen, the usual procedure is gone through for this condition; namely, absolute rest, free diuresis, and diaphoresis, and perfect elimination. Hot packs for thirty minutes twice daily give wonderful results in these conditions. Withdrawal of any of the active etiological factors, such as alcohol, must be insisted upon.

If the heart be at fault and broken compensation be present, the usual cardiac treatment for this condition is to be given; namely, posture, perfect elimination, hot packs and stimulation by the old, well-grounded methods.

None of these acute cases should be allowed to get up too early, but should be kept in bed and a slow and carefully supervised progress should be

insisted upon homogeneous treatment of all patients, particularly strongly under these circumstances. The services of a well trained and properly indoctrinated nurse should be obtained whenever possible.

METHODS

Internal medicine is a case where the placebo should always be given for a definite reason, based upon sound judgment. On the whole, other than penicillin, drugs seem to give no substantial benefit, yet agencies give internally helpful compounds. There were no differences between giving or not internal medication for the control group and none of us would drop the drugs.

However, there may be certain situations in the general in which more are needed in all, or at, or two stages. In the first, the structure is degraded, the time of degradation, whether and brand is added, and in the second stage, and a greater rate in the third and in the early stages.

The recording, given in full, the better or less absolutely indicated by some variation in the heart action. After the immediate danger of rupture of a blood vessel, hemorrhage, or infarction, are passed in most cases to tenders, these ordinary requirements are needed.

Structures given in 150-grd doses are the standard for steady support. Branch and whorls given in varied, tapered doses at regular intervals are helpful when the nature of growth or digestion are occasionally needed. The mixture should be given in 150-grd doses over a long period of time as a safe and effective method of keeping the animal for any number of years. (Borden, Deering, Jr.)

Merck's experts can help during the day and if needed at night, so we'll have a great success. The strategy is to get the child to gradually and dermatologically adapt to the temperature of the gastric medium.

I believe that the vascular system, however, is non-traumatized in all cases of vasculitis, and this has long continued to hold the key to the primary of the vasomotor innervation of the vasculature, the direct pull of the autonomic nervous system on the

In the cases where the time resolution is not the determining factor, the use of the summing amplifier is well justified. It is also very convenient for the case of a large number of cells to be analysed simultaneously. The use of the amplifier is also very convenient for the case of a large number of cells to be analysed simultaneously. The use of the amplifier is also very convenient for the case of a large number of cells to be analysed simultaneously.

circulation by attaching the mesentery to the anterior abdominal wall by intermediate method. This may have succeeded in the hands of some operators, yet so far as phlebectasis is concerned its field of usefulness is narrow.

Occasionally gall-bladder disease, inflammation of the bile ducts or acute pancreatitis, will bring on a limited phlebectasis about the source of trouble. This condition does demand surgical intervention. Drainage of the gall-bladder, ducts or both, is indicated and should be performed under such circumstances.

Chronic Cases. Under this heading the superficially involved cases are the ones that derive most benefit from surgical intervention. It is in those cases that have markedly tortuous veins of the abdominal wall, lower extremities, etc., that yield satisfactorily to surgical procedure. The abdominal wall phlebitis is best treated by the intermittent ligation and partial resection operation. Here and there the veins are cut down upon and ligated. This is done at various points over the entire field, the incisions being long enough to produce a fair scar. The contraction of the scar tissue aids much in giving satisfactory results. Occasionally the vein itself is completely resected for a distance of from two to four inches. Giving time for proper healing following this operation, the results are generally good. It is often wise to have the patient wear a properly fitting belt for some time following convalescence.

Tortuous veins involving the lower extremities are best treated by the internal stripping method. This operation, described below, I devised from the idea suggested by the Mayo external stripping operation. I have used this technic with satisfaction in a number of cases for the past few years.

OPERATIVE TECHNIC.

In the surgical treatment of varicosity the technic that is best systematized will yield the most pleasing results. To be sure, this is true in all fields of surgery, yet too much care can not be taken when stripping a vein.

First, perfect asepsis is essential at all times.

Second, the point of incision should be carefully selected. In stripping the long saphenous vein four skin incisions are generally needed. The four points selected for these incisions are: (1) about one inch below the saphenous opening on the anterior, internal surface of the thigh; (2) about one inch above the internal condyle of the femur on the internal, anterior surface of the knee; (3) one inch below the head of the tibia on the internal sur-

face of the leg; (4) two inches above the internal malleolus on the internal, anterior surface of the leg. If it be remembered that the long saphenous vein can be easily found beneath a line drawn in such a way as to equally divide the internal surface of the thigh and leg, it will never be hard to locate this vein. The only deviations are where it arches outward just below the saphenous opening and posteriorly at the knee, as it passes behind the internal condyle.

Third, the separate incisions need never be more than two inches in length, while in depth they need but pass through the integument.

Fourth, the vein is best stripped by the internal or lumen method, thus leaving the adjacent nerves intact.

Author's Description of Modified Instrument, With Technic of Its Use. The instrument (fig. 7) is about two feet in length and easily bent to accommodate all conditions. *A* represents the shoulder about which the vein is tied. That part of the instrument between *A* and *B* remains outside the lumen of the vein. *C* represents that portion of the instrument which enters the vein first. It is also the point wherefrom to exert traction.

A No. 4 copper wire two feet in length is selected. At one end this wire is looped in such a manner as to produce a somewhat prominent shoulder. (See illustration.) This wire can easily be bent to fit all curves and accommodate circumstances. If desired, a properly plated instrument can be obtained from instrument dealers. The incision below the saphenous opening and that just above the internal condyle are made, the vein dissected out at these points, and raised, for convenience, by passing a director beneath it.

A No. 2 chromic catgut ligature is then used to tie off the vein at these two points. A minute longitudinal incision is then made in the wall of the vein exposed through the upper incision and the unlooped end of the wire passed through the upper incision, down through the lumen of the vein to the lower skin incision. Here another minute incision is made in the venous wall through which the wire is allowed to emerge. This wire is drawn down through the vein until the shoulder of the loop just enters the lumen at the upper incision, while the loop itself is not drawn into the vein. A No. 2 chromic catgut suture is then made to encircle the vein at the upper incision and tied tightly about the shoulder of the loop. All free catgut is then cut close to the knots and the vein is cut loose at the point of both incisions, leaving it free between them. The lower end of the wire is then grasped

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WALTER M. BRICKNER, M.D., Editor

NEW YORK, APRIL, 1914.

RECURRENT OF SYMPTOMS AFTER OPERATIONS FOR PYLORIC ULCERS.

The operative treatment of pyloric and duodenal ulcers forms a brilliant but by no means finished chapter in medical progress. (We say "medical" for the internist has contributed to it no less enthusiastically than the surgeon.) The indications for operation are fairly generally established, and concerning the type of operation to be applied there is considerable and increasing accord, but by no means unanimity. In the secondary, but also very important aspects of the operation there is very much that is still unsettled. Leaving out of consideration, for the time being, the location and method of performing a gastro-jejunal anastomosis, the indications for, and value of the procedures of excising and "infolding" an ulcer, are, we think, still quite unestablished.

It is striking to observe that in many cases gastro-jejunosomy gives immediate relief of the distressing pains and discomforts of a pyloric or duodenal ulcer, even before the patient resumes eating, a relief perhaps afforded by the mixture of the alkaline intestinal secretions with the acid gastric juice, although this simple explanation has not been proven. That the relief does not always continue indefinitely, that often all the ulcer symptoms return after a greater or shorter period following a well-performed gastro-enterostomy, has stimulated a study of the factors that underly the failure of this procedure to cure all cases.

Applying to ulcer of the pylorus and duodenum the same principles that govern the treatment of analogous intestinal lesions, it has been fairly accepted that the mere establishment of another gateway for the food is not, in itself regularly sufficient to entirely sidetrack that food from its normal outlet; and that, therefore, something more must be done to shut off the ulcer from the food track. To accomplish this, von Eiselsberg added to the gastro-jejunosomy the device of unilateral exclusion by cutting through the pylorus and closing both ends with sutures. This is a rational, elegant and altogether surgical procedure, but in the often emaciated, hemorrhage-weakened patient, the added shock of manipulation and the increased time of narcosis which it entails, decidedly increase the operative risk. Berg, of New York, was, we believe, the first to employ the much simpler expedient of applying a stout silk puckering suture about the pyloric region, proximal to the ulcer, tight enough to close the channel, but not tight enough to cause necrosis. Lambotte has employed a twine ligature in a similar fashion. Various surgeons, however, assert that silk and twine ligatures, and the silver wire constrictor employed by Fowler, eventually ulcerate into the stomach and the opening becomes re-established. Whether this is an inherent objection to foreign substances thus employed, or whether such an outcome proceeds from faulty technic in their application, we do not know. Berg has been satisfied with his results, and he has demonstrated the silk thread in place, and the pylorus well-blocked, long after the operation. To escape from the use of a foreign-body constrictor, Wilms recently introduced the employment of a strip cut from the sheath of the rectus abdominis, tied twice around the pylorus. Charles Mayo has also employed a strip of tissue, which, however, he takes from the gastro-hepatic or greater omentum, leaving it still attached at its gastric end, and further diminishing in size the site of blocking "by the application of several interrupted sutures of fine silk to take the strain during the healing process."* Whether living tissue, thus used, possesses more than a theoretical advantage over the silk thread, it is too early to assert.

That the practice of "pyloric exclusion" has greatly reduced the number of recurrences it is now safe to say. But the statement that has been made, that gastro-enterostomy will *always* fail to cure pyloric or duodenal ulcer if the outlet is not pathologically or artificially occluded, is not substantiated by clinical observation nor bismuth-x-ray studies. Nor is it true, as has also been claimed, that a gastro-

intercostal nerve supply be subjected to a trauma, or to a trauma plus infection or irritation, such as may obtain during an operation, more adhesions and a more chronic infiltration of the peritoneum is likely to follow than if the same injuries were inflicted on a peritoneum with normal nerve supply." Nor does his demonstration lose force from the fact that in his experiments he enervated a much wider area of peritoneum than would suffer from division of an intercostal nerve in the rectus sheath. We regret that he did not add to his interesting study observations of the effect of the various nerve divisions upon the muscles themselves.

Quain states that enervation of the parietal peritoneum by injury to an intercostal nerve "will add another strong argument in favor of transverse abdominal incision." We do not think, however, that it is a controlling argument in favor of such an incision, although it may be true that the divided rectus may be reunited without loss of strength or function. But it does add another strong argument in favor of conservation of the intercostal nerves in abdominal section; and this can, and should be, accomplished even in long vertical incisions, either by care in avoiding injury to a nerve allowed to remain stretching across the wound or by gently retracting it to or towards the wound angles, to which latter procedure it yields surprisingly. There are few intra-abdominal procedures that cannot be carried out through a vertical rectus sheath incision, and that without dividing the nerves; and we believe, too, that the instances are relatively few, even in such deep-seated manipulations as are involved in operations on the common bile duct, in which this vertical muscle-splitting (or retracting) incision need be complicated by transverse or oblique division of the rectus fibers.—W. M. B.

Surgical Suggestions

Vulvar verrucae, appearing suddenly without any ascertainable cause, are sometimes associated with a malignant growth in the uterus.

Nocturnal pruritus ani is often prevented, even cured, by inserting a fair-sized hard rubber or metal dilator into the anus for about fifteen minutes at bedtime.

In determining whether or not a female has been infected with gonorrhea, withhold definite conclusions if there are no early evidences. The first manifestation may be a salpingitis several weeks after the suspicious intercourse.

Surgical Sociology

Ira S. Wile, M. D., Department Editor.

THE PHYSICAL EXAMINATION OF RAILROAD EMPLOYEES.

In the general campaign for the prevention of accidents, great stress has been placed upon various educational measures. Industrial organizations have of their own initiative established schools for employees with a view to securing greater proficiency together with increasing safety. The protection of the American laborer involves the protection of the community, insofar as negligence may endanger human lives, particularly where transportation facilities are concerned. It repeatedly has been pointed out that the Government requires a careful physical examination of all candidates for the army and navy and rejects those physically unfit, even though the unfitness be of such relatively minor character as hernia, flat-feet and defective vision.

It would seem obvious that the railroads should endeavor to secure a higher plane of physical efficiency in their employees. It would not be exceedingly expensive to organize a plan for the systematic physical examination of railway employees with a view to eliminating at the outset, those physically unfit for public service.

According to the figures of the Interstate Commerce Commission, sixty-five to seventy per cent. of the accidents reported by railway officials are due to the carelessness of employees. The competence of many of the employees is limited by their physical defects. Safety in transportation is fundamentally dependent upon the physical and the mental competence of railway employees. The senses of sight and hearing, together with mental acuity and moral worth are essential to secure the reduction of railway accidents to an irreducible minimum.

Under the maritime laws, an examination and license of crews is mandatory. There appears to be little reason why a similar regulation should not be exacted from those responsible for transportation on land. The enactment of legislation that will secure the physical examination of railway employees, particularly engineers, firemen, conductors, brakemen, and switchmen will redound to the advantage of the public, the railroads, and the employees. Fully two million men are engaged in the railway services of this country. To base their employment upon physical competency would largely guarantee safe transportation in a more effective manner than is possible at the present time. Numerous railroads train their employees in the physical care of equipment and give more or less adequate training in the handling of rolling stock. Few, however, have appreciated the importance of giving thorough instruction to the employees in the responsibility of caring for themselves and of maintaining health upon a plane that will minimize the

lets. To be sure, the unsallowableness of the tablet would be governed by the length of the "bones" or "nails." The "nails" or "crossbones" should have cast upon them the strength of the tablet in order that a surgeon might not only know that a given solution is a mercury solution, but also that it is a mercury solution of a certain strength.

Finally, I advocate that all poison tablets in this country and in foreign countries be made in *one specific shape*. I would urge the U. S. Government to insist that all manufacturers of poison tablets make them in the same shape. Furthermore, I would ask that they forbid candy manufacturers to make candy or cough drops in any similar shape. Thus, I would have the poison tablet placed in a class entirely by itself.

Book Reviews

The Pathology of Growth-Tumors. By CHARLES POWELL WHITE, M.D., F.R.C.S., Director Pilkington Cancer Research Fund; Pathologist, Christl Hospital, Manchester; Special Lecturer in Pathology, University of Manchester. Octavo; 235 pages; illustrated. New York: PAUL B. HOEFER, 1913.

Over half of the text is devoted to the gross and histological features of the various types of blastomata; the remaining portions discuss the origin, life history, physiological and biological aspects and growth of tumors. The work is written in a didactic form and reflects the author's views exclusively. Indeed the book does not contain a single reference to any other author. The histological descriptions are rather brief and differ in nomenclature from those found in the conventional text-book. The discussion of the broader phases of tumor growth displays a wide knowledge of the subject. In general the author's views are those currently held by most pathologists. The only instance where the author reveals a divergence from the modern trend of medical thought is in his maintenance of hypernephroma as adrenal in origin. The illustrations are nearly all excellent photomicrographs.

Practical Sanitation: A Handbook for Health Officers and Practitioners of Medicine. By FLETCHER GARDNER, M.D., Captain, Medical Corps, Indiana National Guard; Health Commissioner of Monroe County, Indiana; and JAMES PERSONS SIMONDS, B.A., M.D., Professor of Preventive Medicine and Bacteriology, Medical Department, University of Texas; Lately Superintendent, Indiana State Laboratory of Hygiene. Octavo; 463 pages; illustrated. St. Louis: C. V. MOSBY COMPANY, 1914. Price \$4.00.

At the present time, when the science of practical sanitation is becoming so very important, a book such as this is of considerable usefulness. It endeavors to set before the reader the facts most necessary to a clear understanding of modern sanitary science. In a work of four hundred pages it is obviously impossible to more than outline the main points when such varied subjects are considered as epidemiology, including the management of epidemics, isolation, quarantine and disinfection; an account of each of the infectious diseases; a section on general sanitation, including statistical methods, school and factory inspection, sewage and garbage disposal.

In spite of this wide range of subjects, the material is treated in so terse a manner that a very large amount of information is placed at the reader's disposal. This book will undoubtedly be found of great use to the health officer, especially one who is so situated that reference libraries are not at his command. It is furnished with a very complete index.

Infections of the Hand. A Guide to the Surgical Treatment of Acute and Chronic Suppurative Processes in the Fingers, Hand and Forearm. By ALLEN B. KANAVEL, M.D., Assistant Professor of Surgery, Northwestern University Medical School, Chicago. Second edition. Octavo; 463 pages; 147 illustrations. Philadelphia and New York: LEA & FEBIGER, 1914. Price, \$3.75, net.

We sufficiently indicated in the review of its first edition, two years ago, the excellence and the general character of this unique monograph based on painstaking anatomical, experimental and clinical studies. Nothing has been added in the past two years to the pathology or the surgery of hand infections, and so thorough a work as this offered little room for alterations or additions. Nevertheless, it has been submitted by its author to a general revision. To several chapters résumés have been appended for hasty reference. About a dozen new illustrations have been introduced, and the legends under some of them have been amplified. The actual increase in the size of the book is about 20 pages.

We warmly commend a careful study of this work to every physician who undertakes the treatment of even the apparently trivial forms of infections of the fingers and hand.

Practical Prescribing With Clinic Notes. By ARTHUR H. PRICHARD, M.R.C.S., L.R.C.P., R.N. (Retd.), Late House Surgeon, the Brompton Hospital, and Resident Surgeon, R. N. Hospital, Gosport. Octavo; 207 pages. London: HENRY FROWDE and HODDER & STOUGHTON, 1913. Price \$2.00.

The author in this book presents typical histories and descriptions of various diseases and then gives a detailed account of their treatment. The prescriptions used are printed in one column, while parallel to this are given the course of the illness and the various measures used in combating it. The reader thus becomes acquainted with many various methods of caring for the same disease, as the course of each illness is given in detail and different remedies are applied on different days. Following the description of each illness is a short résumé of the pharmacological action of the drugs used, and the reasons for their employment.

The book may be recommended as a very practical one and one from which the reader may gain many helpful suggestions as to treatment.

Studies Concerning Glycosuria and Diabetes. By FREDERICK M. ALLEN, A.B., M.D. Large octavo; 1179 pages. Boston: HARVARD UNIVERSITY PRESS, 1913.

In this truly monumental work the author contributes his experimental studies on various phases of the subject which were carried out during a period of three years in the Harvard Medical School. Each study is accompanied by a thorough critique of the literature. Inasmuch as the author's researches concern nearly every phase of glycosuria and diabetes, the book forms a reference work of the very first order. As such it should be the fountain-head for most subsequent researches upon diabetes for many years to come. The value of the work is enhanced by seventy pages of bibliography. Unfortunately, there is no index.

The Practitioner's Practical Prescriber and Epitome of Symptomatic Treatment. By D. M. MACDONALD, M.D., Medical Officer of Health, Leven, Fife. 198 pages. London: HENRY FROWDE and HODDER & STOUGHTON, 1913. Price \$1.50.

This little pocket edition, besides containing tables of dosage, is chiefly made up of an alphabetically arranged list of diseases with brief suggestions as to their treatment. Naturally not very much information can be imparted when subjects are so briefly considered that the treatment of cholecystitis is given in four lines—that of cirrhosis of the liver in seven lines, that of endocarditis in a quarter of a page. However, the reader will find enough under each heading to afford a suggestion.

Chronic Gastric Ulcer and Its Relation to Gastric Carcinoma. Review of 684 specimens. W. M. MAC-CARTY and A. C. BRODERS, Rochester, Minn. *Archives of Internal Medicine*, February 15, 1914.

The question as to how frequently carcinoma develops in chronic ulcer of the stomach is obviously unanswerable, according to MacCarty and Broders. All that can be definitely claimed is a rather frequent association of histologically typical carcinoma in gastric ulcers. Of 684 specimens of ulcer excised in the Mayo clinic, 191 were chronic ulcers in which no histologic evidence of carcinoma was present; 472 presented the characteristics of simple ulcer plus the presence of carcinoma; in 21 specimens the presence of cancer was doubtful. The ulcer which contains the smallest amounts of carcinoma contains these in the mucosa of the borders and not in the base. This association should lead the practitioner to suspect malignancy in many clear cases of ulcer of the stomach. The differential diagnosis cannot be made by clinical methods, but only by the pathologist after the ulcer has been excised.

Surgical Treatment (Splenectomy) of Diseases of the Blood. (*Die Blutkrankheiten und Ihre Chirurgische Behandlung* (Milzektomie).) K. MUHSAM, Berlin. *Deutsche Medizinische Wochenschrift*, February 19, 1914.

A number of cases operated upon by the author and many others from the literature are analyzed. It is evident that splenectomy can have no effect upon infectious and septic processes in which the enlargement of the spleen is a small part of the general picture. It has no influence upon malaria and is contraindicated in leukemia. On the other hand, a well-timed splenectomy in Bant's disease may be fairly definitely counted upon to result in cure. The latter may obtain even in the third stage of the disease (ascites), when the removal of the spleen is combined with an omentopexy. Seven cases of infantile splenic anemia have been saved by the operation. In a series of cases of hemolytic jaundice, splenectomy appears to have had a very satisfactory outcome. A certain percentage of cases of pernicious anemia are definitely improved by the operation. It is as yet impossible to state in advance which cases will be benefited and for which the operation is of no avail.

Lithiasis of the Branches of the Hepatic Duct. (*La Lithiase des Branches de Bifurcation de l'Hépatique*.) E. QUÉNU and P. MATHIEU, Paris. *Revue de Chirurgie*, February 10, 1914.

This paper represents an effort to draw more widespread attention to a condition which, though not frequently encountered, presents a very difficult problem to the surgeon. After outlining the condition termed intrahepatic lithiasis and referring to an important paper by Beer on that subject, the authors describe minutely three cases of their own and four of Kehr's. In their cases the end result was finally good in all; one patient has remained well for four and a half years. The prognosis of this condition is nevertheless grave, for the lithiasis is generally of very prolonged duration, and recurrences are avoidable only with great difficulty. The authors insist upon the wide drainage of the involved ducts and upon second or even third operations upon manifestations of renewed biliary obstruction when lithiasis of the hepatic ducts coexists with intrahepatic lithiasis, the prognosis is even more grave. Two groups of cases of lithiasis of the ducts are described; one in which the stones are numerous and small; the other, in which the calculi are firmly adherent to the walls of the ducts.

Sulphuric Ether Lavage in Infections. A Preliminary Clinical Report of 30 cases Treated by This Method. G. DE TARNOWSKY, Chicago. *Journal American Medical Association*, January 24, 1914.

In a preliminary clinical report of thirty cases treated by the Souligoux-Morestin method of sulphuric ether lavage of the peritoneal cavity, Dr. Tarnowsky says that his attention was called to the method during a recent visit to the Paris clinics where it is used in five hospitals as a routine measure in all laparotomies. It was his privilege

to watch the *modus operandi* and to notice the absence of unfavorable sequels. Eight years' experience with ether as a local disinfectant had convinced him already that it was harmless as regards cell degeneration, and he quotes the French authorities to the same effect. He began using it in his abdominal operations in the latter part of August, 1913, in both private and charity cases with uniformly gratifying results. The technic is described by him as follows: "After removal of pathologic tissue free pus is carefully wiped out; then ether is freely poured into the abdomen and is allowed to come in contact with all of the viscera in a case of general peritonitis. The viscera are literally washed in ether, hence the term 'lavage' adopted by the French. As much as a quart of ether has been thus used. After having remained in contact with the abdominal organs for from two to five minutes, it is mopped out by means of gauze sponges and the abdomen is closed with one small drain. In circumscribed peritonitis the pus cavity, having been wiped out, is filled with ether and the abdomen is closed without drainage. In pelvic peritonitis, ether-soaked sponges are applied to all involved surfaces, and then two ounces of ether are poured into Douglas' pouch and the abdomen is closed without drainage. The immediate effect of ether, thus applied, is to cause a momentary capillary contraction followed by a hyperemia of the viscera. There is a moderate formation of carbon dioxide in the abdomen, evinced by a bubbling sound and the escape of bubbles from the surface of the ether. Ether is slowly absorbed by the serosa; this is proved by the fact that no change in the anesthesia of the patient has been reported to date." Dr. Tarnowsky's thirty cases included three cases of gangrenous appendicitis with general peritonitis, four cases of localized abdominal peritonitis, two of pelvic peritonitis, and one of acute cholecystitis with adhesions in which the bactericidal action was very apparent. The remaining cases were not acutely septic. In 75 per cent the postoperative pain and restlessness were lessened and were not increased in the remaining 25 per cent. He is convinced that there is less pain than there is ordinarily encountered, and there was no mortality in this series. Experimental study on animals is being carried on by Dr. Bissel in the Cook County Hospital and will be reported later.

Laryngectomy With Associated Gastrostomy. (*Laryngektomie mit Beigefügter Gastrostomie*.) F. TÖRK, New York. *Zentralblatt für Chirurgie*, December 27, 1913.

Törk calls attention to the difficulty in feeding patients after total laryngectomy. The usual method, i. e., by a tube passed into the esophagus, is attended by the great danger of infection of the wound. In order to obviate this, Törk recommends that at the completion of the laryngectomy (which can be done under a local anesthesia) a gastrostomy according to the method of Witzel be performed. In one case in which this procedure was done, the post-operative healing of the laryngectomy wound was unusually free from the complications of infection.

Autogenous Vaccine in the Treatment of Hay Fever. P. M. FARRINGTON. *The Laryngoscope*, January, 1914.

The author injects a vaccine prepared from a film of secretion from along the middle turbinates transferred to agar tubes. An average of two hundred million bacteria were given every fourth day for nine injections. The results were as follows: Out of the twenty-five patients treated, thirteen were cured, six markedly improved, three slightly improved, and three failures. Of the thirteen patients cured, eight had asthma as a complication; of the six markedly improved, five had asthma.

On the Use of Electro-magnets in the Extraction of Metallic Bodies From the Trachea and Bronchi, With Report of Cases. SAMUEL GLAUER. *The Laryngoscope*, January, 1914.

In the literature eleven cases are recorded in which extraction by electro-magnets was undertaken. Seven of these cases were successful. A review of the recorded clinical cases, as well as of the writer's, leads to the conclusion that in exceptional instances the electro-magnet may prove of great value in the extraction of foreign

that the patient was not in a position to give a reliable history of the disease. The patient was in a position to give a reliable history of the disease. The patient was in a position to give a reliable history of the disease.

Acute Phlegmonous Epithelitis. M. J. L.

This is a case of acute phlegmonous epithelitis of the submandibular gland. The patient was in a position to give a reliable history of the disease. The patient was in a position to give a reliable history of the disease. The patient was in a position to give a reliable history of the disease.

Operative Technique for Conservation of the Superior (Fronto-Palpebral) Branches of the Facial Nerve in Total Extirpation of the Non-Cancerous Parotid.

The patient was in a position to give a reliable history of the disease. The patient was in a position to give a reliable history of the disease. The patient was in a position to give a reliable history of the disease.

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The Prognosis of Sarcoma of the Testis

The patient was in a position to give a reliable history of the disease. The patient was in a position to give a reliable history of the disease. The patient was in a position to give a reliable history of the disease. The patient was in a position to give a reliable history of the disease.

Further Observations on the Effect of the Frequency Spark for the Reduction of the Discharge in Selected Cases

The patient was in a position to give a reliable history of the disease. The patient was in a position to give a reliable history of the disease. The patient was in a position to give a reliable history of the disease. The patient was in a position to give a reliable history of the disease.

Observations Following the Use of Carbon Arc Psychography.

The patient was in a position to give a reliable history of the disease. The patient was in a position to give a reliable history of the disease. The patient was in a position to give a reliable history of the disease. The patient was in a position to give a reliable history of the disease.

Cancer of the Prostate. P. J. FREYER, London. *The Urologic and Cutaneous Review*, February, 1914.

This is a clinical presentation of the subject and does not deal with the pathology of the disease and its development from adenofibroma of the prostate (Albarran, Halle): 13.4 per cent of 1276 cases of prostatic enlargement were clinically carcinoma. The condition is therefore much commoner than is generally supposed. The symptoms of malignant disease of the prostate resemble those of ordinary prostatic enlargement. It is very important, however, to note that the symptoms run their course rapidly, in a few months, in fact. Carcinoma should be suspected if the symptoms develop in individuals under fifty or over seventy years of age. It is not necessary to enumerate the symptoms of advanced prostatic carcinoma. Freyer insists that hematuria is a symptom of prostatic hypertrophy rather than of carcinoma, except if the latter be very advanced.

The passage of a soft catheter often aids greatly in the diagnosis. In the majority of cases of benign enlargement the coude catheter easily enters the bladder; in malignant disease the catheter meets with a sudden resistance in the prostatic urethra owing to the dense and unresisting tissue. There may also be pain and a little bleeding as a result. Upon rectal examination the cancerous prostate may present nodules, irregularities, especially the advanced tumors. The most significant feature of malignant disease of the organ is its immobility.

Palliative treatment can alone be practiced for advanced carcinoma. When the growth is yet confined to the interior of the capsule, the results of suprapubic prostatectomy are very good indeed. The details of a number of the cases are presented.

Corynebacterium Hodgkini in Lymphatic Leukemia and Hodgkin's Disease. A. E. STEELE, Boston. *Boston Medical and Surgical Journal*, January 22, 1914.

Steele isolated a diphtheroid organism identical with that first discovered by Negri and Miernet, in one case each of lymphatic leukemia and Hodgkin's disease. Inasmuch as this observation has been confirmed by Bunting and Yates in seven cases of Hodgkin's disease and by Billings and Rosenow in twelve cases of the same malady, the probability that this organism has some definite relation to Hodgkin's disease is rather strong. Billings and Rosenow have suggested a vaccine for purposes of treatment, but thus far no results have been reported.

Two Female Xiphopagi (Deux Fillettes Xiphopages). DE G. LEFILLIATRE and DR. AUBOURG. *Paris, France. Paris Médical*, February 14, 1914.

The authors give a detailed account of two female children who are united by a bridge of tissue at the level of the xiphoid cartilage. The parents were healthy, the mother being forty-four years of age. Pregnancy was normal and the labor proceeded apparently normally until, upon the presentation of the head, all progress stopped. By inserting the hand into the uterus it was found that the fetus was a "monster" and that the second fetus was in a transverse position. A podalic version was performed on the latter and the two children were extracted together, one by the head, the other by the foot. This necessitated a rotation of the bridge of tissue uniting the children, which, however, did not seem to do any harm, for the babies appeared to be quite normal.

The temperatures and blood counts of these two individuals differ. X-ray examination shows that the bridge of tissue contains a rod of cartilage, but apparently no vital organs with the exception of the occasional passage of coils of small intestine from one abdominal cavity into the other during deep expiration. This was repeatedly shown by bismuth x-ray plates.

The children gained in weight on breast milk, and the authors consider them excellent cases for surgical intervention.

Operative Treatment of Internal Hydrocephalus in Infants. (*Traitement Opératoire de l'Hydrocéphalie Interne chez les Enfants.*) L. M. PUSSEY, St. Petersburg. *Revue de Chirurgie*, December 10, 1913.

The author has practiced his operation in twenty infants suffering from hydrocephalus from various causes. The procedure, in brief, consists in an exposure of the right (generally) parietal lobe through a flap incision. The dura is incised, the ventricle aspirated, and a small silver canula is fixed in the ventricular cavity. The fluid escaping from the canula drains into the subcutaneous space. This procedure has been curative in several cases in which the cause of the hydrocephalus is a benign one (inflammatory closure of one of the exits for the fluid). In no instance did the presence of the canula prove irritating. The operation gives the best results only when general treatment is actively carried out.

Technic of Neosalvarsan Injection Into the Jugular and Scalp Veins of Infants. GERMAIN BLECHMAN, Paris, France. *Paris Médical*, January 31, 1914.

The author gives a precise account of the technic of injecting neosalvarsan intravenously in infants. In an experience of one hundred cases he has had excellent results in using the external jugular veins or the veins of the scalp. No preliminary dissection is necessary, and if one has fine calibrated needles with sharp points, as a rule there should be no difficulty in entering the vein. Three assistants are necessary to keep the child perfectly quiet during the injection. Neosalvarsan was used in all the cases. It was given once a week or every two weeks for five to seven injections. The initial dose was at least 1 centigram per kilo; the final dose was $1\frac{1}{2}$ centigram per kilo. However, in children under one year no dose was larger than 2 centigrams, regardless of the weight of the child.

The author claims to have had very little difficulty with the technical part of the drug's administration and believes this to be the method of choice. Only twice did a hematoma from a previous injection interfere with the technic and this was overcome by waiting a few days for its subsidence.

The therapeutic results from neosalvarsan were excellent.

On the Diagnosis of Luxation and Separation of the Meniscus. (*Zur Diagnose der Meniscusluxation und des Meniscusabrisse.*) E. BIRCHER, Aarau. *Zentralblatt für Chirurgie*, November 29, 1913.

The diagnosis of the above mentioned conditions is oftentimes attended by much difficulty, especially if the luxation or separation is of minor degree. Bircher has found that auscultation of the knee during slow passive flexion and extension affords a positive means of diagnosing these conditions. A peculiar rubbing sound is heard on the medial or lateral edge of the meniscus. The sound is more pronounced during flexion than in extension. This sign was confirmed at operation in six or seven cases.

Juvenile Hyperthyroidism. W. H. LEWIS, Rochester, Minn. *The Saint Paul Medical Journal*, February, 1914.

In a period of eight years there have been 1,512 patients operated upon at the Mayo clinic for exophthalmic goiter. Of this number five were under ten years of age (one in three hundred cases). Lewis gives a brief history of each of these five children and discusses the symptomatology of hyperthyroidism in childhood.

In each of these cases there was a firm, noticeably enlarged thyroid apparently hyperplastic to the touch. The following symptoms were noted: vasomotor disturbance of the skin in one, tremor in three, mental irritability in four, tachycardia in five, exophthalmos in five. All the other features observed in the disease in adults participate in the vigorous activities of their associates without apparent cardiac or muscular distress, while none of them even approached the crisis so frequently seen in adults.

A double ligation was performed on three of these patients; in two a portion of the thyroid was resected, one being preceded by a single ligation, all of which operations gave prompt and, up to date, satisfactory results, in contradistinction to adults, most of whom do not seem to be safe without a thyroidectomy. All the patients were girls, their ages ranging from four to eight years.

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THE INSUFFICIENCY OF THE ILLIAC VALVE IN THE X-RAY PHOTOGRAPH

DR. FENSTAD, MINN.

BURNS, ORE. (CONT.)

There are two methods of examining the intestines by the x-rays. The first is the filling process by the Rieder contrast meal, consisting of 350 grammes of gruel and 50 grammes of carbonate (not nitrate) of bismuth or 75 grammes of sulphate of barium. It is necessary to get a pure preparation of the barium, as there have been fatal intoxications from soluble salts of barium. Such accidents can be avoided by prescribing barium sulphate purissimum for x-ray purposes. If the stomach and the small intestines are normal, they will both be emptied six hours after such a contrast meal, and the whole bismuth shadows will be found in the colon ascendens, and by further examinations, after 9, 12, 24 hours, one will be able to examine gradually the whole colon. But if there is a stricture in the stomach or in the small intestine, bismuth ingesta will be found even after a longer period in the jejunum or ileum. Not every retention after six hours, however, is due to a stricture of the small intestine. For *S. Kienan* found out that in cases of enteritis there are often, after 9 or 10 hours, still some bismuth shadows in the lowest loops of the ileum. *Grædel* directed our attention to another group of cases, in which the same retention in the lower parts of the small intestine, and these, too, where there is no stricture of the intestine, as it is easy to find out by the second standard method of examining the intestine by the aid of the arrays: the contrast emulsion, which consists of an emulsion of 150-200 grammes of sulphate of barium, 300 grammes of bolus alba, and lukewarm water to the total amount of a liter of liquid. Such an emulsion, mixed under aseptic care, is of not more than half a meter of length, will in normal cases fill the whole colon up to the caecum. But there are cases in which this contrast emulsion, as the x-ray plate will demonstrate, is retained through the ileocecal valve into the lower loops of the ileum. This is supposed to be influenced by the valve is, as *Grædel* has shown, often associated with a retention of the contrast meal in the ileum, and he supposes that this is caused by the thick-

ened condition of the villi after an inflammation of the ileum, or by a contracted ileum, in which the valve is closed, about gradually and without a causal connection between the appendicitis and the dilatation of the valve, and he believes that the inflammation, swelling of the colal mucosa and the adhesions occurring in most of the cases call forth the insufficiency of the valve. The pains of which his patients complained are to his idea caused by the irritation of the small intestine through their abnormal content.

Dietion was the first who denied that this insufficiency of the valve was a typical pathological symptom, he found it, it is true, in a certain number of cases associated with chronic appendicitis, but also in other cases where there was no affection of the appendix, but other pathological changes in some other part of the colon or its neighborhood. He observed this insufficiency of the valve in cases of spastic obstruction, of obstruction of the so-called ascendens typus, peritonitis, and pericholecystine adhesions and even in a case of hydrophos of the gall bladder and of sporadic abscess. *Schiffert*, too, who observed the stricture in two cases of perityphlitis, does not consider it as a sign of any dangerous valve.

I myself have observed this insufficiency of the ileocecal valve in only three of which there was an inflammation of the appendix.

Case 1. Mr. B., over 60 years old, fell suddenly sick with heavy pains in his right side, there was a slight irritation of the peritonium with a distinct meteorism and a muscular spasm over the ileocecal fossa, but no fever. On account of this, no immediate operation was performed, and he slowly recovered, but the meteorism was still considerable, especially in the right side of the abdomen. The meteorism was not relieved by the use of the catheter, but the meteorism was not relieved by the catheter, but the meteorism was not relieved by the catheter.

Case 2. Mr. C., over 60 years old, fell from a horse and was injured in the right side, there was a slight irritation of the peritonium with a distinct meteorism and a muscular spasm over the ileocecal fossa, but no fever. On account of this, no immediate operation was performed, and he slowly recovered, but the meteorism was still considerable, especially in the right side of the abdomen. The meteorism was not relieved by the use of the catheter, but the meteorism was not relieved by the catheter.

CASE III. Mrs. P. suffered for two months from pains in her right side and there were all the signs of a chronic appendicitis. Six hours after the contrast meal I found ample residues in the small intestines and when an enema (one liter of liquid) was administered, she complained of having pains in her abdomen. On the x-ray plate, some of the lower loops of the small intestine were filled with the bismuth enema. The patient was operated upon and we found adhesions fixing the base of the appendix to the cecum and the tip to the side walls of the pelvis.

This condition seems to me to be a complete explanation for the insufficiency of the valve. The appendix fixed through adhesions to the side wall of the pelvis is always pulling on the lower parts of the cecum and may in that way cause the dehiscence of the valve. But the pains of which the patient complained during the injection were certainly not due to the flowing back of the enema into the ileum, as Groedel supposes, for in my case I could observe the filling of the small intestine long before the patient complained of pains. In some other cases, which showed the same dehiscence of the valve, there were no pains during the injection of the enema, and some of my patients, who certainly had a normal ileocecal valve, suffered pains during the enema. I perfectly agree with Dietlen that the pains are due to the pulling of the adhesions in the neighborhood of the cecum.

In these three cases I am convinced that the appendicitis is responsible for the insufficiency of the ileocecal valve. But in the five other cases there were no signs of perityphlitis at all, though in the next one there might have been pericolic adhesions.

CASE IV. Mrs. G., 68 years old, had suffered for some years from attacks of pains in the right side of the abdomen, with signs of intestinal obstruction. She never had any symptoms suspicious of appendicitis. Considering her good general condition, the long duration of her disease, and the lack of any other intestinal trouble in her record that might have produced a stricture, the probable diagnosis was ileus caused by pericolic adhesions. The x-ray examination showed no abnormal function of the bowels, save the insufficiency of the ileocecal valve.

In the next two cases the appendix had previously been removed.

CASE V. Miss C., a girl of 18 years, with all signs of neuropathic constitution, had been operated upon half a year before for chronic appendicitis. The appendix contained two fecal stones and was

fixed to the cecum by numerous adhesions. The stump of the appendix was buried and the mesenterium was sutured in such a way as to cover it also with normal peritoneum. Four months after the operation she began to complain of attacks of colics in the abdomen. The x-ray examination showed remnants of bismuth chyme in the small intestine six hours after the meal and revealed also insufficiency of the valve. A thorough examination under narcosis disclosed the existence of a tumor of the genitals, and a dermoid cyst of the left ovary as big as an apple was removed; but unfortunately we forgot to look after the ileocecal region and see if there were any adhesions.

CASE VI. Mrs. R. had been operated upon four years before for purulent peritonitis and gangrenous appendicitis. One year later there was another operation for hernia of the abdominal wall, during which we found numerous adhesions between the bowels. Since then she had suffered from attacks of ileus, occurring once or twice a year and during which I always observed in the region of the flexura coli dextra an enormously dilated intestinal loop. Those attacks have until now always passed away under conservative treatment. After the last attack, however, I made an x-ray examination, hoping to find the seat of the supposed obstruction in order to have the necessary information if an operation proved necessary. But I could find nothing abnormal in the position or the function of the intestine, except the insufficiency of the valve.

I think we have a right in this case to suppose that there is a band in the neighborhood of the flexura hepatica, due to the previous peritonitis, which, under certain unknown circumstances, produces the intestinal obstruction. During such attacks, the colon ascendens is dilated, as we are able to observe, so that the valve becomes insufficient. *Genersich*⁸ has observed that by gradually dilating the large intestine we can artificially produce the dehiscence of the valve and he used for therapeutic purposes enemas of 6-9 liters of liquid in order to clean even the higher loops of the small intestine. I think the same dilatation of the cecum and dehiscence of the valve will easily occur in cases of obstruction in the lower parts of the colon. A similar condition may have existed in the last two cases.

CASE VII. Mrs. H. suffers slightly from constipation and she frequently observed traces of mucus in her feces, but she has no enteritis muco-membranacea. She complained of pains in the right side of her abdomen, which her family physician

thought were caused by adhesions, but it was not possible to get a clear idea of her condition. The x-ray examination showed that there was a considerable ptosis of the stomach, and of the large intestine, so that the colon transversum formed very acute angles with the rest of the colon, but as far as I could judge there were no adhesions on these angulations. Ten hours after the contrast meal I still found bismuth. I gave in the lower parts of the ileum and by an enema of one liter of liquid I could easily fill many of the lower loops of the small intestine.

Groedel would perhaps in this case accuse the catarrhal swelling of the mucosa of the colon of the dehiscence of the valve. But I cannot agree with that argument. To my thinking a swollen valve ought to shut easier and earlier than a normal one. I rather suppose that the sharp angulations at the hepatic and splenic flexures may at certain moments form an obstruction to the passage of the feces and produce a dilatation of the different loops and in that way the insufficiency of the valve. The same mechanism may prevail in the cases of chronic obstipation observed by Dietlen, and also in the last case that showed a gross impediment to the passage of the feces in the form of a cancer of the colon.

CASE VIII. Mrs. H. suffers from a cancer of the colon descendens, which quite to my astonishment was not to be demonstrated on the x-ray plate, but I found a very pronounced insufficiency of the valve. The operation explained to me why the x-ray this time had deceived me; the cancer was ulcerated and did not constrict the lumen of the colon; the big tumor that I had felt through the abdominal wall was a metastasis in the mesocolon. But earlier there must have been a stricture of the colon, for the patient had suffered from very obstinate constipation, alternating with diarrhea, and during that period there must have been a dilatation of the colon as evidence that finally caused the insufficiency of the valve.

Of course, it would be very easy to maintain that in all those cases there were chronic perityphlitic inflammations, not to be discovered by the clinical examination. It is true, we often find in a patient on whom we operate in what we believe is his first attack of appendicitis very gross alterations due to former inflammations, that certainly occurred without any manifestations. Further investigation is therefore indicated. It is especially important that whenever a patient is operated upon, who had shown evidences of inflammation of the ileocecal valve, the region of the caecum should be examined.

and the presence of a sense of adhesion be determined. But, in the foregoing paragraphs, I find pathological alterations that explain the mechanism of the delirious state. I would, however, consider these abnormal conditions as the reason of the delirious state is, that even a very slight cause, viz., the want of the insufficiency, *Schleimig* has observed that a spiritual massage may overcome the resistance of the valve and produce the reflux of the contents of the colon in the small intestine. *Säyer* and *Hilfenicht* observed the insufficiency of the valve in cases of spasm of the colon, and they suppose that it is due to the increase of intestinal pressure during the spasm, a mechanism similar to that which I assume for some of my cases. The most serious causes and the slightest changes may thus make the valve insufficient; *Katsch* even observed the symptom in healthy persons, who did not suffer from abdominal troubles at all, and a similar observation is related by *Dielen*.

We therefore have no right to argue that the insufficiency of the ileocecal valve is a sign of perityphlitis, as Groedel supposed. I do not even agree with Lohfeldt that pains during the administration of the contrast enema occurring in patients with this symptom are a sure sign of adhesions due to appendicitis. I think that Dietlen's and my cases demonstrate with perfect evidence that the most varied pathological alterations in the whole colon and even in the neighboring tissues may under certain circumstances produce the insufficiency of the valve. And if it is proven that even perfectly healthy people may show the same symptoms, I think I have made clear that the insufficiency of the cecal valve is a symptom that cannot claim any pathognomonic value—one that we may register as a "mosby," but that does not permit any diagnostic conclusions.

Scalp, face, and other surgical operations are performed with tension, preferably on one of the skin flaps, giving a far better cosmetic result than the operation as generally employed.

EVIL RESULTS OF COLLES' AND POTT'S FRACTURES, AND HOW TO AVOID THEM.

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The reduction of a fracture is an operation that every physician is, at some time or other, called upon to perform. Upon the physician's ability to properly recognize the condition he is dealing with and upon the employment of the proper method of reduction and the maintenance of that reduction, depend the ultimate results. Directly proportionate to the degree of luxation of fragments and their proximity to joints are the loss of function and the deformity. A fracture of a long bone near a joint is more difficult of reduction and retention than when the fracture is near its middle; for one of the levers is necessarily unstable and difficult to hold in place.

To obtain uniformly good results, three things are necessary:

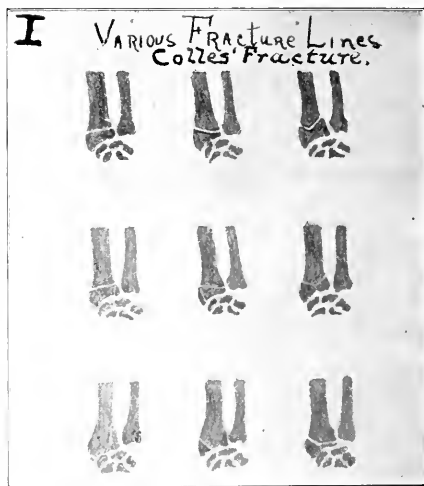
First, a positive and proper appreciation of the condition one is called upon to deal with—and by this I do not mean that it is sufficient when we see a silver-fork deformity to say that we are dealing with a Colles' fracture. It is necessary to make a most accurate diagnosis of associated lesions present; and there is but one way to do this: X-ray your fractures; in most cases a fluoroscopic examination is perfectly satisfactory for making a correct diagnosis, or confirming one previously made. If this is impossible to obtain at the time of the accident, it should be done as soon as possible thereafter; and it will be a revelation how many times a supposedly proper reduction will be found faulty, and how many times unsuspected additional lesions will be found. The fluoroscope should be supplemented by a radiograph.

Secondly, do not attempt reduction of a fracture about a joint (or for that matter, any fracture) except under an anesthetic; it saves lots of hard work on your part and pain and suffering to your patient. Moreover, in many a fracture easy coaptation is obtained under an anesthetic which it has seemed impossible to obtain with the conscious patient.

Next, and most important, is the proper retention of the reduced fracture, and this is most effectually done if the mechanical principles involved in a fracture are clearly understood. The lines of force producing the fracture are often productive of other lines of force which resist reduction and re-establish the luxation; if a proper understanding

of the lines of direction is not had, and the counterbalance employed. Compare carefully the injured part with the opposite uninjured part of your own normal member. Location of bony prominences in relation to each other must be carefully considered; length of limb and often circumferential measurements will add valuable data toward a diagnosis. Inability to make certain motions or abnormal motion about a joint is conclusive of serious disturbance. Crepitus is of course proof of the solution of continuity of bone, as it is produced by the rubbing of the broken ends upon one another.

But let me here give a warning. When called to examine a possible fracture, do not disregard all the physical signs present and begin to hunt for crepitus. Many a poor functional result has been produced by this rough forward and backward, in-



ward and outward bending and pulling. It is, of course, gratifying to have the spectators hear the grating of bone upon bone, but the motor or sensory nerve that is perhaps torn or injured, and the lacerated and stiffened tendons will not be half so much appreciated by the patient who has lost function or sensation as a result of the doctor's diligence or enthusiasm. Much needless strength is expended in the reduction of fractures and dislocations on the part of the doctor, which results only in ultimate discredit to him and in harm to the patient. Be sure of your normal surface anatomy and the distorted relations will speak a language understood at a glance. If there are not sufficient signs that can be elicited without the danger of adding injury to the part, put on a temporary splint and get the member between a Crooks tube and a fluoroscope

the styloid process of the radius is directed laterally and slightly forward when the forearm is in the position of pronation. In the position of supination it is directed laterally and slightly backward.

The styloid process of the radius is situated in a patient with a supinated limb, at the level of the lower third of the forearm across the lower end of the wrist, ulnarward and somewhat anteriorly. The styloid process of the ulna is situated in the middle of the forearm, and may be situated in the middle of the radius, or to 1 inch above the middle of the radius. The radius may extend from the wrist to 1 inch above the middle of the radius, or vary as shown in figure 1. The distance indicated by this fraction is the type of deviation of the radius. The dorsal distal end of the lower fragment may be located at the level of the articular surface of the radius, or in a line lower than the articular surface of the radius.



In the position of pronation, the styloid process of the radius is directed laterally and slightly forward. In the position of supination, the styloid process of the radius is directed laterally and slightly backward. The styloid process of the ulna is situated in the middle of the forearm, and may be situated in the middle of the radius, or to 1 inch above the middle of the radius. The radius may extend from the wrist to 1 inch above the middle of the radius, or vary as shown in figure 1. The distance indicated by this fraction is the type of deviation of the radius. The dorsal distal end of the lower fragment may be located at the level of the articular surface of the radius, or in a line lower than the articular surface of the radius.

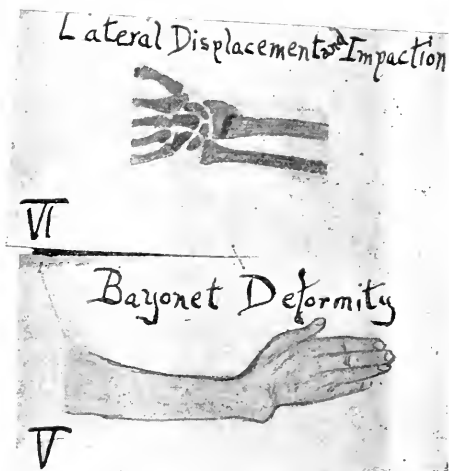
RELATIVE POSITIONS OF STYLOID PROCESSES OF ULNA AND RADIUS



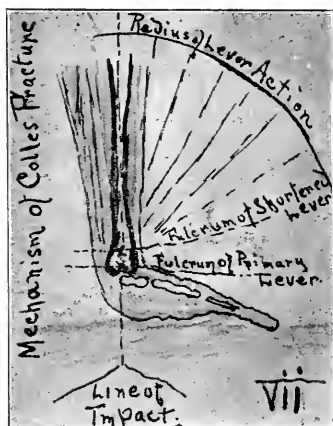
The evil after-results of this injury are directly due to the degree of un-reduction that is allowed to remain. The fracture produces a wrist increased in all its dimensions with a consequent tension of tendons and ligaments. Add to this the laceration of tendons and sheaths, the tangents at the site of fracture over which they must now ride and the formation of callus both in front and behind, and it is small wonder that deformity and loss of function is the result unless proper reduction is made (fig. 8).

Do not attempt to pull this fracture into place; you may get the lower fragment down if not impacted too hard, but you will not be able to bring it into proper lateral apposition without the employment of a great deal of force, and only by sheer luck can you properly reduce it in this manner. A

upper and lower fragment are in contact, then sharply flex the hand and the fracture is reduced (fig. 9). Once reduced, if the hand is kept flexed it will not easily become re-dislocated. Examine now with the fluoroscope and note the apposition;



simple and always effective way, one that does the least possible damage to tissues, is to continue the lines of force that produced the fracture. Over-extend the hand; lay the back of the hand against the arm if necessary; remember that the *lower fragments is attached to the hand and moved with it*, and if the hand is extended back until the slack of the anterior ligament is taken up, then the lower fragment follows the hand, and the impaction is freed. While the hand is in this over-extended position, usually at a little more than right angles to the arm, the lateral displacement is corrected by pushing the hand to the ulnar side. This is usually accomplished with but little necessity for force. When the hand is in relatively normal lateral position, push against the lower fragment, keeping the hand over-extended, until the posterior lips of both



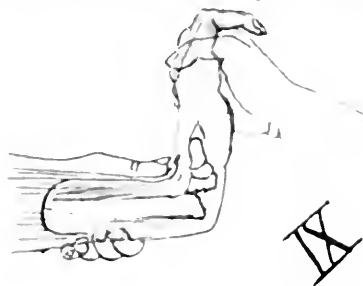
if it is not accurate, repeat the procedure until reduction is perfect, for upon perfect reduction depends perfect function and in just that degree of imperfect reduction that we allow to persist will there be deformity and loss of function. If the tip



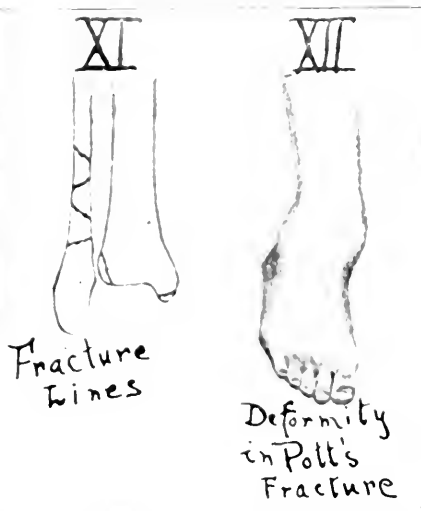
of the styloid process of the ulna is fractured it is easily held in place by a strip of adhesive plaster.

Any splint that holds the hand in a position of flexion will give good results. The important thing is to keep the hand flexed; this locks the lower fragment tightly in position and a disturbance of

Reducing Colles Fracture By Over-Extension



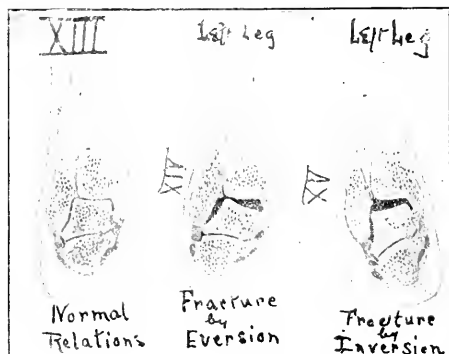
Position After Reduction



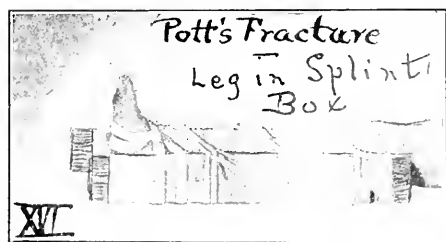
is Pott's fracture, a fracture of the tibia and fibula, usually at the third, fourth or fifth inch from the ankle (Fig. 11). It is usually caused by a fall on the lateral malleolus, and the lateral malleolus of the tibia is broken. The fracture is usually comminuted, and the bone ends are displaced along with the tibia, and the foot is twisted laterally. The treatment is to reduce the fracture by twisting the foot sideways, and to immobilize the foot in a plaster cast.

allowed to walk on the foot before body union is well established, the astragalus crowds the external malleolus outward and the foot is everted, and the patient walks on the inner edge of his foot or in a position of talipes valgus.

In contrast to Colles' fracture, which is difficult to reduce, but once reduced easily held in place, Pott's fracture is easily reduced, but hard to hold in reduction. To reduce, invert the foot strongly,



pushing the astragalus against the styloid process of the tibia, then strongly flex the foot, pulling it forward. In this position of flexion and inversion it must be maintained, or evil results, such as spreading of the mortise between the fibula and tibia, with consequent eversion and backward dislocation, are sure to result. Many methods have been tried and all of them are found wanting at some time. An effectual fixation of the inversion



is by several two-inch strips of adhesive plaster fastened to the outer edge of the dorsum, brought under the sole, across the internal malleolus and in a semi-spiral up on the leg; after applying which put the leg into a box splint, pad the heel well with a cotton ring pad and raise it higher than the calf, so that the leg may be crowded against the bottom of the box by placing wads of cotton on it, or better, by adhesive straps across the leg and down on each side passing through the bottom of

the box by means of slits (fig. 16). This fixes the leg in both desired positions: the spiral fixes the inversion, and the raised heel and depressed calf fixes the flexion, all of course to be reinforced by packing and bandaging. This limb may be kept here until union has taken place or until the bones are fixed, and then put in plaster. It is extremely difficult to put this fracture up in plaster and maintain the proper relations, and it is best not to try it until some union in the proper position has taken place. If the fracture is reduced in this manner and the positions of inversion and flexion are maintained, a uniformly good functional result is obtained in from six to eight weeks.

40 SOUTH STREET.

A NOTE ON NASAL SYNECHIAE.*

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A nasal synchia is an adhesion between two parts of the nasal cavity. It may be fibrous, cartilaginous, or of a bony nature, and usually stretches from the septum to the lateral wall, although synchia are sometimes found running from one turbinate to another. The size may vary from a hair line to a broad band.

Synchia can be classified as:

1. Non-fibrous.
2. Fibrous.
3. Cartilaginous.
4. Bony.

1. The non-fibrous type is found within a month after the operation causing its formation. It consists of a slight amount of young connective tissue and a number of small bloodvessels. It is of a pinkish color and bleeds easily.

2. The fibrous type is merely the result of the growth of scar tissue and is found at a longer interval after operation than type 1. It does not bleed as readily, owing to the lessened number of bloodvessels and is not as red.

3. The cartilaginous variety is usually congenital, especially if found in the young. A probe examination will distinguish between this and type 4.

4. The bony type is similar to the cartilaginous, differing only in composition.

A previous operation is generally the cause of synchia formation, but ulcerative processes, such as syphilis lupus, and nasal diphtheria, must be considered. The reaction to operative work, in the nose, whether with the galvano-cautery or from resection, is variable. Some cases form a false membrane, underneath which healing occurs and no synchia form. Others have considerable post-

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STRAIGHT DIRECT LARYNGOSCOPY, BRONCHOSCOPY AND ESOPHAGOSCOPY.

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BALTIMORE, MD.

(Continued from April Number.)

CHAPTER V.

Diseases of the larynx amenable to treatment through the direct laryngoscope. In taking up diseases of the larynx amenable to treatment, the writer has thought it more practical to give illustrative cases which have been selected from his clinical work. Acute laryngitis can nearly always be diagnosed with the mirror in adults. In a patient seen some months ago a low hanging epiglottis and a sensitive pharynx prevented a view of the larynx. After hypodermatic injection of morphine and atropine and the application to the pharynx and larynx of alypin (20% solution), the small laryngoscope was passed with the head straight. The entire larynx was much reddened and thickened. The vocal cords were swollen and looked like raw beef; the false cords met on phonation; the posterior wall stood out like a pouch. Only once before, in Krause's clinic in Berlin, had the writer seen such a picture and that patient was cured by persistent treatment. The writer's patient had a specific history so a probable diagnosis of acute laryngitis, engrafted on a chronic condition, was made. Under treatment the acute inflammation gradually cleared up so that in a month he could talk with a hoarse voice. Specific treatment seemed to have no effect. He is still being treated with nitrate of silver and continued improvement seems to indicate that the diagnosis was correct. In this case the writer was particularly impressed with the great value of direct laryngoscopy. One could not have seen the larynx satisfactorily with the mirror or the pharyngoscope and a diagnosis would have been guesswork without the aid of the direct laryngoscope. The method is worth learning, however expert one may be with the mirror, for cases like the above will occasionally be met with. In children acute laryngitis is quickly and easily diagnosed by direct laryngoscopy. DeZeng's portable battery or, in houses supplied with electricity, the controller may be used as the source of light. In

all doubtful cases of acute laryngitis in children, the direct tube should be used to exclude more serious trouble. As seen through the tube acute inflammation usually presents more or less redness of the cords with absence of subglottic swelling, membrane or edema. In severe cases subglottic swelling, the so-called subglottis laryngitis or edema, may be found and, since the diagnosis is so easily made by examining the larynx with the head straight, it should never be neglected in suspicious cases. In the small larynges of children, slight swelling may result fatally. Through the use of the direct laryngoscope, prompt and efficient treatment can often be instituted and life saved. These cases in children present the strongest argument for all laryngologists to become expert in the use of the tubes.

Chronic laryngitis in adults can usually be diagnosed and treated with the mirror without recourse to the tube. Occasionally, however, the tissues may be greatly thickened so that more radical treatment than applications may be needed. About three years ago a lady, 23 years of age, was referred to the writer for hoarseness of some months duration. Examination with the mirror showed peculiar reddish thickenings on the posterior wall, the vocal cords posteriorly and in the anterior commissure. Two laryngologists had made a probable diagnosis of tubercular laryngitis. The patient had multiple neuro-fibromata of the skin and, thinking there might be some connection between the two conditions, the writer sent her to a dermatologist who reported that there could be no relationship. The patient went to her home in Virginia and two months later returned greatly distressed at the complete loss of her voice. In the larynx the thickenings seemed to have increased somewhat. Through the direct laryngoscope the diseased tissue was removed as well as possible and submitted to a pathologist who reported "chronic inflammation." After repeated applications of nitrate of silver had given no relief, the patient expressed a desire to consult a laryngologist in another city. He examined the larynx, sent her to dermatologists and had x-ray pictures made and finally characterized the condition as "fibrosis of the larynx," a condition similar to the skin tumors. He expressed the opinion that if she ever recovered her voice, it would be rough and unnatural and that she would have to be removed and that eventually a tracheotomy might have to be done. On the way home the patient spent a month with her sister in Cumberland, Md. At the end of that time she appeared in the writer's office talking with her natural voice and has since remained entirely well. The case

tuberculosis of the posterior wall and the arytenoid cartilages, one should not hesitate to operate through the tube and to remove as much diseased tissue as may be necessary. In patients with painful deglutition curettage is the best method of treatment often relieving pain as if by magic. Ulcers are best treated by biting them out and applying formalin later. All these operations are, of course, dependent upon mild symptoms or quiescent lesions on the part of the lungs. When active symptoms are present, no operation should be attempted unless pain is so great as to endanger life from starvation. Some years ago the writer was consulted by a man, 30 years old, for some pain on swallowing and a husky voice. No general symptoms such as cough, expectoration, night sweats or temperature were present. While the patient was rather frail as to physique, he had no difficulty in doing his work as an electrician. Examination with the mirror showed infiltration and ulceration of the left border of the epiglottis with some thickening of the posterior wall. Before attempting any treatment of the larynx, the writer advised examination of the lungs; the patient consulted Dr. L. P. Hamburger, who, after two examinations, could find nothing suggestive of tuberculosis. It was impossible to examine for tubercle bacilli since there was no expectoration. The writer then proceeded to remove the infiltration and ulceration of the epiglottis and the thickening of the posterior wall through the direct laryngoscope. After the operation it looked as if all diseased tissue had been removed. Dr. J. L. Hirsh examined the tissue making a number of sections through the different specimens. He reported the presence of giant cells and tubercle bacilli which left no doubt as to the diagnosis. After a few applications of lactic acid the wounds healed, the voice cleared up and the patient was apparently well. After healing, the epiglottis showed where the tissue had been removed. The patient was advised to change his vocation and to live in the open air; he soon began to gain in weight and at this time, four years after his infection, looks the picture of health. This case has never been reported as one of primary laryngeal tuberculosis because such cases are so extremely rare but clinically it was one.

In 1911 the writer was consulted by a lady who, shortly after the birth of her baby in the latter part of 1910, developed pulmonary tuberculosis. She responded to treatment, the lungs becoming quiescent. In February, 1911, her voice became husky. With the mirror the posterior wall showed a thickening which was evidently the cause of the

huskiness. Under alypin anesthesia the thickening was removed through the direct laryngoscope with the head straight. Applications of lactic acid were then made with the result that healing took place and the voice became normal. The patient remained well until September, 1911, when she developed intestinal symptoms which proved to be tubercular and resulted in death in November of that year. In the case of a man with a large tubercular ulcer of the left false cord causing severe pain on deglutition, curettage through the direct laryngoscope followed by cauterization resulted in complete relief of pain. In this patient pulmonary symptoms were active but it was thought better to operate than to see him starve. The best method of applying the electric cautery is through the direct laryngoscope; the treatment of tubercular lesions with the cautery has opened up a new field for therapy.

Singer's nodules. These tumors are best treated by removal through the direct laryngoscope. With the mirror it is impossible to remove such small growths without danger of injuring the vocal cords. Under alypin anesthesia with the small tube and the head straight, it is comparatively easy to bite off the top of the nodules so that the shrinkage of healing makes the cords smooth. Since the tumors are situated at the junction of the anterior and middle thirds of the cords, it is obvious that one must use a tube which will expose the anterior commissure without force since the hand must be steady to operate without injuring the cords. With a large tube this is impossible. One should use a small straight cutting tip which will cut along the surface of the cord and not a pointed one to attempt to pick off the nodule. After thorough anesthetization the laryngoscope is passed and the forceps introduced down to the nodule; the blades are opened to cut from the side and not at the point. The inner point is shaved off and the remainder shrivels up. The opposite nodule is then treated the same way. If one is skilled in direct laryngoscopy, the rest cure is never necessary in singer's nodules. The tip which the writer uses is made by Pfau; it is a tiny instrument and works perfectly with his universal handle. Three years ago a young lady consulted the writer for slight hoarseness which prevented singing. She had singer's nodes and when they were removed as above described, her voice cleared up permanently. The removal of the nodes is probably the most difficult operation through the direct laryngoscope but the writer considers it easier than the simplest operation with the mirror. Fibromata on account of their size are easily removed through the direct

uvula. A small growth was seen which was thought to be on the left vocal cord. The same afternoon the larynx was anesthetized with 20% alypin solution and the small tube was passed with the head straight. When the larynx was exposed the small growth on the left was seen below the vocal cords while on the opposite side there was a large tumor covering the true and false cords; in the anterior commissure was another growth. With Pfau's forceps the papillomatous tissue was soon cleaned out and the false and true cords exposed. In another patient who had three operations for papilloma of the left vocal cord by the indirect method, the small tube was passed with the head straight and the tumor successfully removed so that there has been no return. Papillomata in children are so important on account of the small larynx and the difficulty in treatment, it may not be amiss to go into the treatment through the direct laryngoscope which has been successful in the writer's hands. In the beginning it is well to repeat that anesthesia, local or general, should never be used in young children. It is far better to operate without anesthesia than to subject a child to its dangers. The little patient is held on the table with the head straight as above described. The small tube is passed between the incisor teeth and the larynx quickly exposed. When the papillomata are seen, Pfau's cutting forceps are passed through the tube and as much of the growths cleared out as possible. By working carefully normal tissues are not injured. If bleeding obscures the view, adrenalin chloride, 1 to 3000 is used. A small copper wire, attached to a fulguration outfit, is now passed and the high frequency spark about one-fourth of an inch long is applied to the bases of the growths. If the masses are extensive, almost closing the larynx, the patient is kept in the hospital a day or two. With this treatment most of the papillomata can be destroyed at one sitting. One week later the treatment is repeated and so on until the patient is cured. It makes no difference how small the throat is, the small tube can be successfully used. If direct laryngoscopy had made possible nothing else than the successful treatment of papillomata in children, its fame would be safe for all time. With this treatment papillomata can now be cured in a few weeks while the old methods required months or even years. Fulguration is much more difficult to use with the head in extension over the end of the table. The writer is convinced that if this method of treatment is generally adopted, tracheotomy would be done rarely. No laryngolo-

gist would think of advising a laryngotomy and yet the writer has recently heard of a case in one of our leading hospitals in which a surgeon—not a laryngologist—did the operation, scraped the papillomata and surrounding tissue thoroughly with a curette and sewed up the larynx. The wounded surfaces promptly grew together causing complete stenosis of the larynx; the patient is wearing a tracheal canula and the surgeon is wondering how she will get rid of it. With modern methods of treatment such a termination would be impossible. In these cases of papillomata in which dyspnea and cyanosis are marked, it is better to do a tracheotomy because these symptoms show almost complete closure of the larynx and the operation gives one a chance to clean out the growths. In a short time the canula can be permanently removed. Laryngologists must impress upon parents and the public generally, the importance of examining the larynx in adults and children when hoarseness persists for any length of time. If children can be treated in the beginning of papillomatous growths, there will be no tracheotomy.

In malignant growths the writer does not advocate any intra-laryngeal operation. But in cases of doubtful diagnosis direct laryngoscopy assumes an important place as regards removal of specimens for microscopic examination. With various cutting tips it is possible to cut as deeply as may be desired. To work with certainty, however, one must have the head straight to secure muscular relaxation and must use a small tube. Then it is no more difficult than removing tumors. A letter from a fellow laryngologist in another city may be interesting as bearing on this point. He says: "I had three months ago the chance to remove by direct laryngoscopy with your position a carcinoma of larynx invading the right vocal cord above anteriorly, partly also the ventricle Morgagni and region below the vocal cord (about a big hazelnut) in such a successful way that the voice is completely restored, no recurrence is visible and the vocal cord is restored."

The writer does not advise such operations in malignant growths but if one decides on intra-laryngeal interference, he will certainly find the straight position of the head and the small tube the easiest and best method of operating.

In recurrent paralysis of a vocal cord the diagnosis can usually be made with the mirror. If, for any reason, the larynx cannot be seen, the diagnosis can be made with the direct laryngoscope. So little force is used in holding the epiglottis forward with the small tube that the patient has no trouble

they offer no difficulties in cases where the conditions of autoscopia are not too unfavorable. The indirect procedure would here be extremely uncertain."

The writer wishes to say that with the straight position of the head and the use of the small tube, he considers all cases favorable for direct laryngoscopy. He cannot imagine a case in which, with patience and perseverance, the larynx could not be examined. He has repeatedly performed both simple and difficult operations through the small tube and is therefore in a position to say that an apparatus to force the larynx back, such as is exemplified in Brunings' counter-pressure instrument, is never necessary in direct laryngoscopy. He thinks he can also say with certainty that general anesthesia is never necessary in direct laryngoscopy except in older children who cannot be held and in certain nervous cases such as chorea.

Stenosis of the larynx. In the treatment of stenosis of the larynx, direct laryngoscopy occupies the first place. It gives the means of seeing exactly how much of the larynx is closed and of cutting through the cicatrized tissue as no other method can. The writer's method of procedure in these cases in adults is to examine first with the mirror and then to use direct laryngoscopy, with the knife ready to cut through the diseased tissue. If the stenosis is complete, the patient is already wearing a tracheal cannula. In such cases the cicatrix is immediately cut through in the middle line with no attempt to save the vocal cords because they are usually so tied up in the cicatrix as not to be visible. The opening is then dilated until a large intubation tube passes easily. The tracheal cannula is removed and a forceps passed through the tracheal wound to clamp the lower part of the intubation tube: a hard rubber piece is then screwed on the handles of the forceps to hold the tube permanently in the larynx. This apparatus was devised by Dr. John Rogers and, in the opinion of the writer, is the best method of treating stenoses. The tube is removed from time to time, cleaned and replaced. In children the treatment is carried out with the patient flat on the table and the head straight. The small tube is passed, the operation performed through it, if necessary, and Rogers' apparatus applied. In practically all cases the bowl of the intubation tube will be too large for the patient, adult or child, to swallow comfortably and it must be shaved down considerably. One of the writer's patients has worn his tube six months without extubation and breathes as easily as when it was first put in. The writer prefers this treatment

to laryngostomy, the after treatment of which is usually more or less painful. In children the tube must be removed every two or three weeks because the small tube stops up with thickened secretion.

Some years ago a girl, 6 years old, was brought to the writer from Cumberland, Md., with the history of difficult breathing for six months. She was examined with the head straight on the table and, on exposing the larynx, a membrane which resembled cuts of congenital web was seen between the anterior two-thirds of the vocal cords allowing a small space posteriorly for breathing. Since the membrane appeared thin a successful attempt to break through it with a six year intubation tube was made. The patient wore the tube two weeks at the end of which time it was removed, cleaned and replaced. The mother took the child home and, instead of bringing her back in a month, as she had been instructed to do, returned in two months. On the removal of the tube the direct laryngoscope showed the larynx clear and, since the voice was practically normal, the patient was discharged as cured.

In January, 1912, Dr. R. A. Warner asked the writer to see a child, 2 years old, at the Sydenham Hospital who had been intubated for diphtheria and had worn the tube five days; during convalescence dyspnea developed and grew gradually worse until the breathing could be heard over the room. The little patient was examined with the direct laryngoscope with the head straight. Exposure of the larynx showed a large subglottic mass springing from the left wall of the larynx and almost closing the lumen. The patient was immediately intubated with a one year tube and taken to the Presbyterian Hospital for observation and treatment. That afternoon she coughed the tube up; an attempt to pass a two year tube failed so the first tube was replaced. That night she again coughed the tube up and was hurried to the writer's office in a taxicab gasping for breath and markedly cyanotic. She was intubated at once and taken to the hospital where the writer did a tracheotomy with the intubation tube in the larynx. When the trachea was entered, the tube was pushed up. The patient recovered promptly and a few days later Rogers' apparatus was adjusted. It was removed every two weeks and the larynx examined directly. It was interesting to watch the disappearance of the pathological mass from fortnight to fortnight. It slowly melted away and in May the larynx appeared normal so that the apparatus was removed permanently. The child has remained well with a normal voice.

direct laryngoscopes were too large to allow a satisfactory view of the larynx. The child had had a peculiar crowing sound in breathing since birth. After exercise the sound was louder and the mother was becoming alarmed though there was never shortness of breath or cyanosis. The patient was examined with the small tube with the head straight on the table. When the larynx was exposed, the tissues seemed a little thickened but not enough to account for the noisy respiration. The vocal cords did not seem to open as well as perfectly normal cords and it was not possible to get a good view of the subglottic space. In view of the negative findings no treatment was recommended but the larynx will be examined from time to time as a precaution.

Just to show that the straight method is as easy in young babies as in older children, the writer wishes to cite a case which he saw some years ago at the Garrett Hospital at the instigation of Dr. J. Staige Davis. A little patient, 11 months old, was intubated for diphtheria and during convalescence, developed dyspnea which gradually increased. At the examination a subglottic stenosis was found. Despite the small larynx no difficulty was experienced in the examination.

The safety of direct laryngoscopy. The writer considers direct laryngoscopy absolutely safe under normal conditions. Even when the contraindications are present, such as arterio-sclerosis, dyspnea, etc., the use of the small tube and the straight position of the head make the method practically safe. The writer does not hesitate to examine any case in which he thinks direct laryngoscopy may be of help.

The practicability of direct laryngoscopy. When one becomes expert with the tube, he can examine the larynx almost as quickly as with the mirror. Five minutes is a fair estimate and one is well repaid for the direct vision. A great advantage is that an operation can be immediately performed. The difficulty of examining children with the mirror makes direct laryngoscopy indispensable in this class of cases. With the method described above, one can examine the child's larynx in two minutes without pain or traumatism.

Anesthesia in direct laryngoscopy. Anesthesia was taken up in a general way in Chapter 11 but it is a subject of such importance that a few words here may not be amiss. If cocaine is used, a 4% solution should be brushed over the wall of the pharynx and the epiglottis with a curved applicator. After waiting two or three minutes the laryngoscope is introduced, the epiglottis pulled forward

and a straight applicator, holding a 10% solution is applied to the larynx. In a few minutes the larynx is sufficiently deadened to proceed with the examination. If an operation is necessary, more cocaine may have to be used. This drug must be used cautiously for one never knows when he may strike a patient with an idiosyncrasy for it. Two years ago the writer used a small quantity to anesthetize the larynx and trachea for a bronchoscopic examination. The patient felt perfectly well after the examination and was allowed to leave the hospital. He took a car and, after leaving it, went into a restaurant to get supper. He remembered nothing after paying his bill. At 10.30 o'clock that night he was arrested for drunkenness and, after a hard fight with two officers, was taken to the station house where he had to be forcibly held to prevent his doing himself bodily harm. At 1.30 o'clock in the morning, after he had quieted down somewhat and it was learned that he was suffering from cocaine poisoning, he was taken to the University Hospital where under the influence of sedatives, he gradually recovered. At 9.00 o'clock A. M. when the writer saw him, he was rational but remembered nothing that had happened the night before. At 2 o'clock P. M. he was nervous and excited and upon inquiry it was found that he had been given atropine. This was stopped and that night he was in good shape except for weakness. He afterwards told the resident physician that the application of a belladonna plaster would poison him. This case is cited to show how dangerous cocaine may be; the writer believes every patient should be questioned before the use of the drug as to possible idiosyncrasies. Since this experience the writer has used no more cocaine. His method of anesthetizing the larynx now is as follows: The pharynx and epiglottis are brushed over with alypin or novocain solution (20% solution). After waiting two minutes the tube is introduced and a solution of the same strength applied to the larynx. This suffices for an ordinary examination. If an operation is necessary, the same solution is applied to the vocal cords. If, perchance, a general anesthetic is needed, the writer's preference is ether preceded by a hypodermatic injection of atropine. In children no anesthetic is used for examination or operation. Cocaine is dangerous and they are so easily held on the table that no anesthetic is necessary. Formerly all adult patients received a hypodermatic injection of morphine and atropine, but this has been discarded as unnecessary. In a book on diseases of the larynx published comparatively recently, the following is found: "Inspection

among these was the illustrious Bland-Sutton who (prior to 1901) remarked that he was convinced from his experience and observation that primary ovarian gestation had no existence; Lawson Tait contended that extra-uterine pregnancy was never ovarian, but always tubal; Kelly and many others claimed ovarian gestation must be exceedingly infrequent because never encountered in their experience, and the possibility thereof being so remote it might as well be entirely ignored; as late as 1905 Wathen declared "ovarian pregnancy is so infrequent as hardly to be worth considering, and but few authenticated cases are on record."

During the period when the existence of ovarian gestation was thus vigorously disputed, details concerning celiotomy for ruptured extra-uterine pregnancy, pelvic hematocele, peritonitis, pelvic cellulitis, ovarian hematoma, "blood-cyst" of the ovary, ovarian apoplexy, etc., were commonly recorded in gynecological literature. Evidently it did not occur to the distinguished operators that in the majority of instances the so-called "blood-cyst" of the ovary, pelvic hematocele, ovarian apoplexy, "rupture of the ovary," could be legitimately included in the classification of ovarian hematomata, the origin of which might more often than otherwise be ovarian gestation!

On the other hand, however, although accurate ante-operative diagnosis for obvious reasons remained impracticable, long before 1901 German writers frankly admitted the possibility of ovarian gestation, and while several examples had previously been demonstrated following celiotomy or necropsy, Spiegelberg (1878) was the first to formulate definite indications, the fulfillment of which he claimed must be assured to establish a positive anatomical diagnosis, viz.:

- (1) That the Fallopian tube must be intact and have no organic connection with the gestation sac;
- (2) That the gestation sac must occupy the position of the ovary, and be connected with the uterus by the ovarian ligament;
- (3) That definite ovarian tissue must be found in the sac wall.

While it is admitted that the foregoing criteria are important from the viewpoint of positive anatomical diagnosis, unless celiotomy be undertaken during the first few weeks of the gestation, fetal development may have so altered or destroyed normal topographical relationship as to render accurate diagnosis impracticable. Particularly is satisfactory diagnosis impossible, even after careful histological investigation, if celiotomy be long delayed, e. g., in not a few instances has necropsy

demonstrated that long-standing lithopedios most likely owed their origin to ovarian rather than tubal or abdominal gestation, there being complete obliteration of the ovary and utero-ovarian ligament, the corresponding Fallopian tube being normal in location, size and conformation.

It is recognized that literally utilization of the designation "primary" ovarian gestation should be restricted to those examples in which fertilization of the ovum occurs before its liberation from the Graafian follicle, yet for reasons hitherto suggested demonstration of this feature may be absolutely impossible by any known method of examination. Therefore, certain modifications in the criteria of Spiegelberg seem essential, and since investigation heretofore prosecuted has suggested no reasonable and understandable explanation for the existence of so-called "blood-cyst" of the ovary (ovarian hematoma), pelvic hematocele (ovarian hematoma), apoplexy of the ovary (ovarian hematoma), rupture of the ovary (ovarian hematoma), etc., the following additional dicta appear pertinent:

- (a) Provided the Fallopian tube be intact, i. e., unruptured, normal in location, size and conformation, if the ovary be implicated as suggested, even though "the gestation sac may not (invariably) occupy the position of the ovary" (Spiegelberg), ovarian gestation cannot be positively excluded;
- (b) Provided the Fallopian tube be normal, if the ovary be markedly enlarged, even though histological investigation may not positively demonstrate "definite ovarian tissue in the sac wall" (Spiegelberg), ovarian gestation cannot be certainly excluded;
- (c) Provided the Fallopian tube be normal, if the ovary be ruptured or incorporated in a cystic tumor, including the so-called pelvic hematocele, etc., more often than otherwise the origin is ovarian gestation;
- (d) Provided the Fallopian tube be normal, if the ovary be entirely obliterated, as occurs in large tumors, lithopedion, etc., the ligamentum ovarii proprium may also be obliterated, hence the fact that the "gestation sac is not connected with the uterus" (Spiegelberg) is immaterial so far as the diagnosis is concerned.

Regardless of the diagnostic and anamnestic acumen of the observer, it is admitted without serious disputation that the ante-operative diagnosis of ovarian gestation is a physical impossibility, there being nothing pathognomonic in the clinical history nor the subjective and objective symptoms by which differentiation is practicable from other varieties of ectopic gestation, the conditions being the same

The authors further describe the tumor as follows: "The mass is distinctly separated from the tube and its fimbriae is irregularly spherical, and measures 0.5 x 5.5 cm. The gestation sac is a spherical cavity 32 mm. in diameter, which is completely lined by the membranes; the latter can be easily stripped from the wall. The thickness of the wall varies from 1.2 to 1.5 cm., except at the placental site, where it is over 2 cm. thick. The cavity contains an embryo 23.5 mm. long, which is connected to the wall by a slightly twisted cord 11 mm. in length."

Microscopically, the wall of the sac showed three layers; the innermost being amnion and chorion; external to this was a layer consisting mainly of erythrocytes, fibrin, and masses of detritus; the outermost layer, not definitely marked off from the latter, was ovarian tissue. The whole periphery of the vesicle showed villi, not numerous, but evenly distributed, and branching into the layer of blood and fibrin. The connective tissue of the villi was well developed. The epithelium of the amnion was in general cubical with ovoid nuclei. The variation in staining of the cell protoplasm in different cells in the same section, and the occurrence of vacuoles, were probably to be regarded as different functional condition of the cells. The syncytium was seen in some places as a simple layer, in others as bud-like masses of densely staining multiform nuclei, or as protoplasmic threads without nuclei. The outer layer of the sac consisted of ovarian tissue—chiefly fibrillar connective tissue. There was no small-celled infiltration, and elastic fibres were completely wanting. This tissue was quite vascular. The blood vessels must be regarded as dilated capillaries. Ova in various stages of development could be found in the outer layer of the sac wall.

From the clinical report and the findings the authors draw the following conclusions:

(1) This was undoubtedly a case of true ovarian pregnancy, for, in the first place, the ovum is completely surrounded by ovarian tissue containing larger and smaller follicles. There is no evidence that the ovum was first imbedded elsewhere and later found its way into ovarian tissue. The tube is separated from the ovary throughout its length, and no part of the fimbriated end is in any way connected with the gestation sac.

(2) Death of the embryo occurred some time before the operation, as evidenced by its small size, compared to the period of gestation. According to the former, it should be three months old, but its size would show it to be not more than five or six weeks. Moreover, there are no vessels in the villi or membranes, and no red blood corpuscles. The latter should be abundant, had the death of the embryo been quite recent. It is, however, possible that the embryo may present some developmental anomaly, as there is some want of differentiation of the face and extremities, but this might be due to post-mortem change. These questions, it is admitted, might be settled by a microscopical study of the embryo.

(3) The amnion (and to a less extent the chorion) continued to grow after the death of the

embryo, and were still alive at the time of the operation, as is shown by the appearance of the cell protoplasm and the nuclei. The small number and the wide separation of the villi may be accounted for by the fact that no new ones were formed, and the existing villi were separated by the growth of the chorion. Degenerated villi are found only in that portion of the chorion which would later have become the chorion laeve. The growing ovum met greater resistance from the dense ovarian stroma than it would in the uterine or the tubal mucosa, which is shown by the compressed connective tissue adjacent to the blood layer. There is nothing in the chorion to suggest malignancy.

(4) Decidual cells, "as might be expected," could not be found; and if present, it is probable that they would have been found in some of the hundreds of sections studied. The decidual cells may have degenerated, but it is more probable that none were formed. This view is supported by the fact that a number of other observers reporting ovarian pregnancies found no decidual cells. We (Freund and Thome) have previously shown (and this is supported by the researches of Wallingren) that decidual cells are by no means constantly found in tubal pregnancy. If decidual cells are not always present in tubal mucosa (which closely resembles that of the uterus) when it is the site of an ectopic pregnancy, it is not remarkable if they are absent in ovarian pregnancy. The authors claim to have found decidual-like cells in a hemorrhagic multilocular cyst removed from a patient in whom pregnancy could not be excluded. The presence of glycogen and the absence of fat are not proof of the decidual character of the cells.

(5) This pregnancy probably originated in a follicle. Most likely at the time of rupture the ovum did not escape into the abdominal cavity, but remained in the follicle, where it was fertilized. The follicle may have ruptured "into a recently ruptured follicle," which would favor its retention. The follicle may have ruptured into a cystic rest of the Wolffian tract. The ovum may not have been liberated from the *discus proligerus*, and as it may be fertilized in the tube while still surrounded by the *corona radiata*, we (F. and T.) may assume that the discus cells would not prevent fertilization. Finally, the ovum may have been fertilized in the abdominal cavity and become imbedded in a niche on the surface of the ovary. An inflammatory process or a cystic degeneration can be excluded. The abnormal development of the sexual organs must be considered.

GOTTSCALK: Chief complaint severe pain in right side, diagnosis probable extra-uterine pregnancy. Celiotomy: Specimen showed right tube normal, site of ovary occupied by soft tumor size of orange, uterus normal. The ovarian tumor contained yellowish fluid, in which was the embryo laying in free yolk sac, the amnion being intact. In wall of gestation sac was a Graafian follicle.

JAGGARD: Seven years previously, passed fleshy mass, pronounced by attendant "false conception." Since then every two years prolonged periods of uterine hemorrhage. A year ago missed two men-

size and ruptured. Villi found at point of rupture, syncytial cells discovered in various portions of ovisac wall.

FREUND AND THOME: (See detail report): Amenorrhea three months, then uterine hemorrhage, sacral and pelvic pain; uterus enlarged, freely movable; to right ovoid tumor size of orange. Celiotomy, pelvis contained considerable quantity sero-sanguineous fluid. Tumor, enlarged right ovary, on blood infiltrated surface multiple follicle-like projections; tube entirely free. Small dead fetus; outer layer gestation sac ovarian tissue.

HEWETSON AND LLOYD: Six weeks after last menstruation severe pelvic pain and collapse, following day blood and shreds *per vaginam*. Celiotomy, large amount dark colored fluid in peritoneal cavity; uterus enlarged. Pregnant ovary was represented as a rounded plum-colored mass; small amniotic cavity. (This patient was sent to hospital with diagnosis of subacute appendicitis.)

KELLY AND McLEROY: Had not menstruated six weeks, severe pain both iliac regions, hemorrhage following day. Two weeks later, diagnosis extra-uterine gestation. Celiotomy, unruptured hemorrhagic cyst size large plum sprang from left ovary, tube normal. Left ovary twice normal size; gestation sac extremely thin, no fetus found; well developed corpus luteum. Entire gestation sac, ovarian tissue.

JACOBSON: Missed one menstrual period, four days thereafter uterine hemorrhage and pain, passed fragment whitish in color, size of walnut. Diagnosis ectopic gestation. Celiotomy, oöphorectomy and partial salpingectomy, ovary represented by rounded mass, near center small cavity containing embryo.

SCHICKELE: Amenorrhea two months, then irregular hemorrhage lasting three days, no pain nor collapse. Celiotomy, tube normal, gestation sac ruptured, large "pelvic hematocoele" in which were found chorionic villi and amniotic remains.

WEBSTER: Missed one menstrual period, severe abdominal pain, following day blood and shreds *per vaginam*. Celiotomy, half ounce dark fluid in utero-vesical pouch. Small ovarian tumor irregularly rounded, slightly adherent to adjacent structures, amniotic cavity in center of mass; tube normal.

IBD: One menstrual period missed, irregular bleeding became profuse, patient confined to bed; uterus normal in size. Celiotomy, right ovary converted into rounded dark-colored tumor adherent in Douglas cul-de-sac, surface lobulated. In center of ovarian tumor small ovoid cavity lined with amnion and containing fluid; tube normal. Fetus attached to wall of cavity.

KERR: Last menstruation November, missed December; in January two attacks pain. Diagnosis ectopic gestation. Celiotomy, January 13th, uterus enlarged, two pints dark blood in peritoneal cavity; right tube and ovary excised. Tube slightly enlarged, hemorrhagic, rupture had occurred; large corpus luteum present. The ovum was found, amniotic cavity small; follicle pregnancy. Two hundred and seventy-six days after last menstruation, viz., August 19th, the patient gave birth to

healthy full term child. The author believes the intra- and extra-uterine pregnancies began at the same time.

NORRIS AND MITCHELL: One menstrual period missed, week later irregular hemorrhage, abdominal pain, characteristic of ectopic gestation. Celiotomy, considerable free blood in peritoneal cavity, ovary enlarged; tube normal. Springing from interior surface of ovary gestation sac, outer covering continuous with *tunica albuginea*. In center of ovisac was amniotic cavity. Ovary unusually vascular, center occupied by large *corpora albicantia*. Between ovisac and ovary large corpus luteum; no fetus found.

NORRIS: Last menstruation March, each month thereafter until August "slight show." In August profuse hemorrhage three days, menses irregular until October, then ceased. No pronounced pain any time. Uterus enlarged, deviated to right, left central portion abdomen occupied by irregular mass reaching nearly to umbilicus separated from uterus by distinct groove. Celiotomy following February, left ovary gestation sac size of orange, ruptured, fetus macerated, five months' development. Tube normal; sac contained placenta and membranes.

KIRCHNER: Tumor noted right ovarian region, which as pregnancy advanced, was pushed toward left. Fetal movements fifth month. Celiotomy, tumor resembled ovarian cyst, contained full term healthy fetus which was easily resuscitated. Left tube free, right incorporated with outer surface of gestation sac; ovarian ligament connected with gestation sac which contained placenta and fetal membranes.

MacDONALD: Missed one period. Four hours after development of symptoms indicating rupture of ectopic gestation, celiotomy revealed pelvis filled with blood clots, no active hemorrhage. Right ovary soft, collapsible, three times normal size, "hollowed out from above" so that only thin layer ovarian tissue remained to form sac wall. Cavity within ovary contained small clot, after removal of which slight oozing noted.

GALLERAY: Two weeks after regular menstruation, irregular discharge of blood. Interval of month with no hemorrhage then recurrence with intense pelvic pain, distension and vomiting. Celiotomy, four months' fetus; exterior of sac ovarian tissue.

REBIN: Sharp radiating pain right side; chilly sensations, fever, weakness, leucorrhea, abdomen tympanitic; tenderness left side. Uterus enlarged, on left small tender mass. Diagnosis, probable ectopic gestation. Celiotomy, uterus non-pregnant size, left tube bent upon itself, attached to ovarian mass, adherent to broad ligament near uterus. Left ovary edematous, chocolate-brown irregular (protruding) surface, considered degenerated *corpus luteum verum*. Small plum-colored mass (hazelnut size) free in pelvis. Site of gestation left ovary which was attached to uterus by proper ligament.

PRINCE: Last menstruation June, nausea, fainting spells. In August slight return of menses, pelvic pain. In November violent fetal movements, uterine hemorrhage. Following February move-

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TWO CASES OF UNUSUAL COMPLICATIONS FOLLOWING CRIMINAL ABORTION.*

RUFUS B. HALL, M.D.,

CINCINNATI, OHIO.

Complications following criminal abortion are of frequent occurrence; and they are so far-reaching in their varied pathology that they are much dreaded by every physician called upon to treat them.

It is not my purpose to offer anything new, nor to call attention to the many dangers and the varied complications following in the wake of these operations, for they are all too familiar. I desire, rather, to place upon record two cases of unusual complications, each of which required the most serious operation to save the patient's life; also, to make some suggestions looking to early surgical intervention, such as vaginal section and drainage in those cases of infection in which the uterus has been perforated, and the early drainage of pus accumulation, with the hope of avoiding more serious complications later.

I am convinced from my experience in the management of a large number of these cases, that early vaginal section and free drainage will not only save many lives and shorten the period of convalescence, but will also prevent more serious complications, which will certainly follow if pus accumulation is left to be taken care of by Nature's process.

CASE 1. Mrs. O. L., age 32, mother of one child, was seen June 9, 1906, in consultation with Dr. C. E. Van Meter, who had been called to take charge of the case the preceding day. Inquiry elicited the following history: Menstruation was established when the child was five months of age. The second period came six weeks later; the next in five weeks after that date. When the menses did not again recur at the expected time, the patient, fearing that she was pregnant, used domestic remedies for several days to bring it on, without success. The patient was a frail, poorly nourished, small woman, the wife of a laboring man, and did not want another child. She went to a doctor whom her neighbors told her performed abortions. The patient said that he used an instrument inside of the uterus and her description of it was that of a uterine probe. She made four or five visits to his office at intervals of four or five days. At each visit the doctor used the same instrument, but the patient said he did not cause much pain, until the last visit, on March 5th, when he told her that he was going to use more energetic treatment, and it would surely bring on her period. This treatment caused great pain and she had great difficulty in reaching her home, which was a mile or more from the doctor's

office by street car. Arrived home, another physician was called and found her in collapse. But he was kept in ignorance of the fact that she had consulted or been treated by the abortionist. The patient developed a general peritonitis of a severe type and for many days her life was despaired of. Two or three days after the peritonitis commenced, she informed her physician of having consulted the abortionist, and asked him why she had not aborted. Nor at any time during the subsequent illness did the patient abort. The subsequent history of the case proved that she was not pregnant at the time she visited the abortionist, and that he perforated the uterus and infected her in his manipulations. These people were like many in the city, and when they found that the patient did not recover quickly, they discharged their doctor after three or four weeks and sent for another one. This second physician treated the patient for a few weeks and he was likewise discharged. Several physicians had been in attendance and several consultations had been held over the patient. The last was a few days before the case was seen by me. At that time the specialist, who is one of the leading men in our city, is reported to have stated that the patient had a large ovarian tumor, and that she also had sepsis, but her condition was so desperate that an operation was not to be thought of at that time.

After this report the husband discharged both physicians and called Dr. Van Meter. The patient's condition at that time was desperate, for she had been confined to her bed with sepsis for fourteen weeks. She was greatly emaciated, having a chill every day or two, followed by profuse sweats, her pulse was feeble and rapid, often reaching 160 and 170 after her chill, with a temperature from 101° or 102° to 104° or higher. The abdomen was as large as that of a woman at full term, and appeared much larger in her emaciated condition. By every physical sign, one would be justified in saying the enlargement was due to an ovarian tumor. Resonance could be elicited in two small areas only; one over the hypogastric region, 1½ inches by 3 inches, the other in the left lumbar region, 1½ inches by 2 inches. We doubted the presence of a cyst. The contour of the abdomen with the patient on the back was more flattened out than is usual in ovarian cyst. The history was that of infection and it was more probable that the fluid was in the abdomen than in a cyst. We advised operation, as that promised the only hope.

The operation was performed at the Bethesda Hospital, June 11, 1906. An abdominal section was made and 2½ gallons of thin, yellow pus were evacuated. After the abdominal cavity had been cleansed, a most interesting condition was observed; all of the intestinal coils were adherent together and to the posterior wall, and not a single inch of the intestinal tract could be recognized as such. The uterus had been lacerated at the fundus from one horn to the other, and in this rent there was lodged the great omentum, which was now greatly thickened. The omentum was not adherent to any of the viscera or to the abdominal wall. The only operative procedure inside of the abdomen was the

*Read by title at the meeting of the Southern Surgical and Gynecological Association, Atlanta, 1913.

of the severe symptoms and general improvement. In about five or six weeks, menstruation was established for the first time since the illness commenced, more than eight months before. The flow continued five days. She menstruated irregularly afterwards, about every three to eight weeks. The duration of the periods varied from five to seven days, the normal period being three to four days. The patient was able to be up most of the day and direct her household duties. Up to the time of the last relapse, which occurred about January 20, 1913, the history of the case was a repetition of that given above. While the abscess was discharging freely, the patient's condition was bearable, yet she was septic at all times. Once every six, seven or eight weeks, the opening would close, to be followed by a week or more of fever, pain and severe illness, until it again discharged its contents into the bladder. The last attack did not differ from the many which had preceded it, except that the pus contained some fecal matter. The patient recovered from this attack as rapidly as any which had preceded it, except that the bladder tenesmus was greatly aggravated. The feces discharged through the bladder rapidly increased in amount. Her suffering from the bladder tenesmus was so great that she for the first time would consider the repeated urgent advice of her physician to submit to an operation.

At the time of her visit to me, she weighed about ninety pounds, her normal weight being 120. She was very feeble and was just up a few days from her recent relapse. At the time of the examination, the patient said that since her first illness she always had pain in the right side of the pelvis and abdomen, and the urine contained a large amount of pus, excepting during her acute attacks, at which time it was greatly reduced. The urine now contained a large amount of pus and bowel contents. Examination revealed the uterus slightly enlarged, pushed to the left side of the pelvis, and fixed, with a large mass at the right, which, with the uterus, filled the pelvis full, and extended some three inches above the pubic arch. The right kidney was below the border of the ribs and was more than twice the normal size. The left kidney could not be palpated. A cystoscopic examination revealed the bladder contracted and very much inflamed. The left ureteral opening could be easily located, discharging normal urine into the bladder. Near to and in front of the right ureteral opening was a tumor mass as large as the end of the index finger, which proved to be the opening into the bowel and abscess cavity. The right ureteral opening could not be located, which was much regretted, on account of the enlarged kidney on that side. But inasmuch as the kidneys were secreting almost or quite the normal amount of urine, an operation was advised and made the following day.

Upon opening the abdomen, there were no adhesions to the abdominal wall. The pelvic cavity and the lower right side of the abdomen were filled with a mass that included the bladder, uterus, and several coils of small intestines. The fingers could be passed to the left of the uterus, down to the pelvic

floor, there being no adhesions on that side. No ovary could be detected. The uterus and the tumor in the right side filled the pelvic cavity. On the top of these were the great mass of adherent coils of intestines. These were separated from the uterus and bladder, inspected, wrapped in gauze and laid aside. The tumor, which proved to be a pus tube and suppurating ovary, with a perforated appendix, was removed. The bladder was liberated from its adhesion to the anterior wall of the uterus, and found to be greatly thickened, with a hole in it through which the thumb could be easily passed. The opening in the bladder, owing to the greatly thickened condition of the bladder wall, was closed very imperfectly with catgut. Turning to the repair of the intestine, there was a large opening into the mass of adherent bowel, through which the finger could be passed. In separating the different coils, four in number, each was found to have an opening at the point of attachment to the bladder. These openings were separated from each other distances of about twelve to eighteen inches. There was also a large ragged hole in the head of the colon. These were repaired by suture of Pagenstecher's linen. The right kidney was examined and nothing abnormal could be detected, excepting its greatly increased size. The left kidney was normal in size. As mentioned before, there were no adhesions on the left side. There was also a complete congenital absence of the left ovary and tube. It is unusual to have a pelvic abscess open into the bladder. This is the first case that I have observed. The patient had a slow but satisfactory convalescence. She has regained her former weight and strength, and excepting the usual reflexes of the menopause, is enjoying excellent health.

These cases are interesting as illustrating in a marked degree the tenacity to life in some cases of infection. They also emphasize the serious and dangerous complications arising in these infectious cases, where accumulations of pus are left to nature in place of being treated by modern surgical methods.

There is no question but that it requires good surgical judgment in the management of infection following abortion, to decide which one should be drained and which one should not be, especially these cases of criminal abortion. In many cases, the patient uses various instruments upon her own person, and not infrequently perforates the uterus in her attempts at abortion, and the danger of infection is very great. Also, I am convinced that not infrequently do professional abortionists perforate the uterus in their attempts at abortion.

In the treatment of this class of cases in my public hospital work, as well as cases seen in private practice, for years I have frequently made vaginal section and drainage. In those cases of infection in which we suspect that the uterus has

been perforated, and especially if there is an accumulation of peritoneal fluid in the pelvis, drainage should be established early, not waiting for the formation of pus. In all cases that do not progress satisfactorily after a period of six or eight days from the commencement of the infection, drainage should be considered and the case watched carefully for a pelvic accumulation, and if that occurs, drainage should be established at once. In not a few cases three or four weeks may elapse from the time of the infection before the accumulation of fluid or pus formation can be made out, but as soon as it can be done drainage should be established. If case No. 1 in the report had been subjected to a vaginal drain with a week or so after her last visit to the abortionist, she would probably have made a prompt recovery after a short convalescence. In case No. 2 I had a vaginal section made three or four weeks after her first infection, she would likewise have recovered with a comparatively short convalescence.

RECOMMENDATIONS

The rational cure of parametritis of the uterus has a long way to go, which is due more to inefficient methods of operation and post-operative medical attempts to restore function than to the character and location of the disease. We are coming to the conclusion that parametritis is located in the middle of the broad ligament and should be made as the rule, an incision in the middle of cases of parametritis in the early stage of the infection, and at a later stage, after the outer segment has been removed, the middle segment should be cut out and the infected portion cut out, the remaining segment left with the best chance of a permanent cure.

High internal drainage of the uterus is often the best means of drainage, but it is not as good as the external drainage. The external drainage should be considered as a rule in all cases of parametritis.

The frequency of the infection of the parametrium has been increasing in the last few years, and it is probable that the incidence of this disease will continue to increase. In all cases of parametritis the drainage should be made in the middle of the broad ligament, and the infected portion should be cut out. The drainage should be sufficient to prevent the accumulation of pus, and the drainage should be continued until the infection has been completely removed. The drainage should be continued until the infection has been completely removed. The drainage should be continued until the infection has been completely removed. J. May, M.D., New York City.

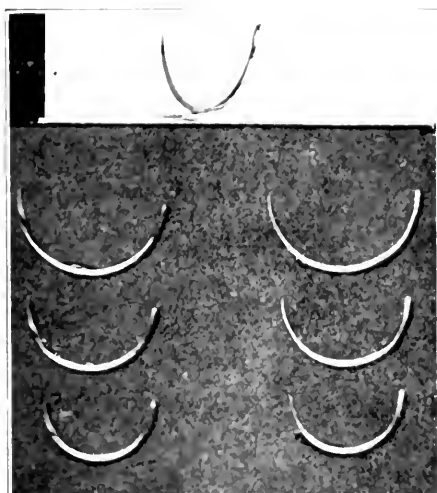
REPORT OF A CASE OF RUPTURED NEEDLE

By C. C. COOPER, D.D.S., D.M.D.

Chief Surgeon, Los Angeles City and County Hospital, Los Angeles, California; Chief Surgeon, Los Angeles City and County Hospital, Los Angeles, California.

These needles have the following features:

The eye is large enough to be easily threaded with large suture material, is grooved to take care of the doubling of the material, and is not any larger than the shaft of the needle. Hence there is no tearing or cutting of tissue.



The needles are made of high quality stainless steel and are polished.

The needles are made in two sizes, 1/2 inch and 1 inch, and are available in both sizes.

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WALTER M. BRICKNER, M.D., Editor

NEW YORK, MAY, 1914.

THE FATE OF THE SURGEON.

The medical sciences have become so amplified that no individual any longer attempts to master all of their branches. Medical practice has now become a matter of team-work. In the diagnosis and treatment of a surgical disease, the patient, who can afford it, has the advantage of several experts in several specialties. The family physician once represented all of the skill—both medical and surgical. Later the surgeon represented all of the surgical skill. Now the surgeon shares it with other specialists having to do with surgery.

The radiographist, the gastro-enterologist, the urologist, the bacteriologist, and all of the specialists at times perform services which the patient needs and which the surgeon cannot perform. Besides these there are the nurse, the historian, and the anesthetist—all important adjuncts. Moreover, while the dividing line between surgical and medical diseases is being more clearly defined, the dividing line between surgical and medical patients scarcely longer exists. As a nearer approach to perfection in the treatment of surgical diseases is attained, more and more attention is given to the whole patient, who is now regarded as a community of organs with various disorders and possibilities of disorder, all more or less intimately correlated to the surgical disease. The best results in surgical works are attained when these facts are reckoned with.

While this trend in the development of surgery is of importance from the scientific standpoint, it has also a significant relation to the economics of our art. It is developing at a time when there is a strong urge towards the larger social application of all useful knowledge and skill. So long as the various scientifically coordinated specialties remain economically separate business enterprises, defeat of their best possibilities is invited. Their highest sphere of usefulness can be attained only by their economic as well as scientific coordination.

This means that either the members of the medical profession must go into partnership with one another or that they must go into partnership with the public. Either economic competition must fall in line and give place to economic cooperation, just as we now have scientific cooperation; or the public must confiscate the medical profession as it is now proceeding to do in England. The surgeon must syndicalize himself or the public is going to socialize him. One or the other of these is inevitable. Either is to be preferred to the present competitive system in which both surgeon and patient are the victims of economic maladjustment.—J. P. W.

THE REMOVAL OF THE APPENDIX IN APPENDICULAR ABSCESS.

We were much interested, and rather surprised, to learn from a recent article by Van Buren Knott (*Journal of the A. M. A.*, March 28th) that the practice is still very common among surgeons of merely draining appendicitis abscesses without removing the offending organ. We agree with Knott that this insufficient surgery is not good practice. It usually involves the necessity of a second operation, often preceded by debilitating sinus suppuration; and, rather than avoiding danger, it invites it. The policy of leaving the appendix is based, no doubt, on the fear that by separating "protecting" or "walling-off" adhesions in the effort to remove it, infection will be spread to the uninvolved peritoneum. This is an old fear inherited from the earlier methods of dealing with appendiceal suppuration, and quite abandoned, we thought, by experienced surgeons. Repeated observations quite justify the opposite stand, viz., that the most important step in the prevention or cure of suppurative peritonitis is the immediate removal of its possible focus. Moreover, as Knott points out, the exposure of the appendix also often reveals other pockets of pus that, unemptied, would have caused serious mischief. The search for and amputation of the appendix is, to be sure, often not a simple matter, but to the experienced surgeon (and no sur-

Surgical Sociology

Ira S. Wile, M. D., Department Editor.

THUMBS AND WORKMEN'S COMPENSATION ACTS.

Among the most characteristic features of the human being is the development of the hand. To be a handy man requires the possession of all the fingers and both thumbs. The industrial value of an individual is interfered with to a greater extent by the loss of a thumb than by the loss of an eye.

The relative values and importance of the fingers decrease in a direct ratio to their distance from the thumb. It is of interest, in view of the various workmen's compensation acts which have been enacted, to note what consideration has been given to injuries occurring to thumbs and fingers. In many of the laws no specific compensation is given for particular fingers of thumbs, but the compensation is given for total injury of the hand. There are various rules existing for compensations for the loss of a phalanx or even or two phalanges. The difference in values of the thumbs and various fingers is worth considerable study, not alone from the standpoint of conservative surgery, but also from the standpoint of medical jurisprudence and social legislation.

Without discussing the merits of the various laws that have been enacted, we append a résumé of the compensation for minor disabilities as found in the compensation acts of twelve states where the disabilities and compensations are specifically mentioned.

Connecticut.—For the loss of a thumb, thirty-eight weeks; for the loss of a first finger or a great toe or third finger, twenty-five weeks; a fourth finger, twenty weeks; for the loss of any toe except the great toe, thirteen weeks. The loss of one phalanx of a thumb or two phalanges of a finger shall be considered half the loss of a thumb or finger respectively, and shall be compensated accordingly.

Illinois.—For the loss of a thumb, or the permanent and complete loss of its use, fifty per centum of the average weekly wage during sixty weeks.

For the loss of a first finger, commonly called the index finger, or the permanent and complete loss of its use, fifty per centum of the average weekly wage during thirty-five weeks.

For the loss of a second finger or the permanent and complete loss of its use, fifty per centum of the average weekly wages during thirty weeks.

For the loss of a third finger, or the permanent and complete loss of its use, fifty per centum of the average weekly wage during twenty weeks.

The loss of a fourth finger, commonly called the little finger, shall be considered to be equal to the loss of one-half of such thumb, or finger, and compensation shall be one-half the amounts above specified.

The loss of one phalanx of the thumb, or of any finger, shall be considered to be equal to the loss

of one-half of such thumb, or finger, and compensation shall be one-half the amounts above specified.

The loss of more than one phalanx shall be considered as the loss of the entire finger or thumb; provided, however, that in no case shall the amount received for more than one finger exceed the amount provided in the schedule for the loss of a hand.

Iowa.—For all cases included in the following schedule compensation shall be paid as follows, to-wit:

(1) For the loss of a thumb, fifty per cent of daily wages during forty weeks.

(2) For the loss of a first finger, commonly called the index finger, fifty per cent of daily wages during thirty weeks.

(3) For the loss of a second finger, fifty per cent of daily wages during twenty-five weeks.

(4) For the loss of a third finger, fifty per cent of daily wages during twenty weeks.

(5) For the loss of a fourth finger, commonly called the little finger, fifty per cent of daily wages for fifteen weeks.

(6) For the loss of the first phalanx of the thumb or of any finger shall be considered to be equal to the loss of one-half of such thumb or finger, and compensation shall be one-half of the amounts above specified.

(7) The loss of more than one phalanx shall be considered as the loss of the entire finger or thumb; provided, however, that in no case shall the amount received for more than one finger exceed the amount provided in this schedule for the loss of a hand.

Massachusetts.—For the loss by severance at or above the second joint of two or more fingers, including thumbs, or toes, one-half the average weekly wages of the injured person, but not more than ten dollars nor less than four dollars a week, for a period of twenty-five weeks.

Michigan.—For the loss of a thumb, fifty per centum of the average weekly wages during sixty weeks.

For the loss of a first finger, commonly called index finger, fifty per centum of average weekly wages during thirty-five weeks.

For the loss of a second finger, fifty per centum of average weekly wages during thirty weeks.

For the loss of a third finger, fifty per centum of average weekly wages during twenty weeks.

For the loss of a fourth finger, commonly called little finger, fifty per centum of average weekly wages during fifteen weeks.

The loss of the first phalanx of the thumb, or of any finger, shall be considered to be equal to the loss of one-half of such thumb or finger, and compensation shall be one-half the amounts above specified.

The loss of more than one phalanx shall be considered as the loss of the entire finger or thumb; provided, however, that in no case shall the amount received for more than one finger exceed the amount provided in this schedule for the loss of a hand.

Nevada.—For the loss of a thumb, fifty per cent

weekly wages of the injured employee, but not more than fifteen dollars nor less than five dollars a week, for a period of twenty-five weeks. For the loss by severance of at least one joint of a finger, thumb, or toe, sixty per cent of the average weekly wages of the injured employee, but not more than fifteen dollars nor less than five dollars a week, for a period of twelve weeks.

Book Reviews

Diseases of the Heart. By JAMES MACKENZIE, M.D., F.R.C.P., LL.D., Ab. and Ed., F.R.C.P.I. (Hon.), Physician to the London Hospital (in charge of the Cardiac Dept.); Consulting Physician to the Victoria Hospital, Burnley. *Third edition.* Octavo; 500 pages; illustrated. London: HENRY FROWDE, Oxford University Press. HODDER and STOUGHTON, 1913.

It is interesting to compare the present edition with the first, published only five years ago. We find that the work has been almost entirely re-written. This indicates two things: first, that cardiac pathology is undergoing rapid and profound changes; and second, that Mackenzie, who is largely responsible for this newer impulse, still remains in the vanguard of students of cardiac disease. This edition also differs from the previous one in three particulars. First, in the clearer differentiation of the signs of disease. Here the electro-cardiogram has been of great service. Second, the bearing of heart manifestations on cardiac failure. Third, the basing of treatment on sound and scientific principles. There is hardly any need to remind the reader that Mackenzie created a new era in text-books on diseases of the heart. This edition still reveals every attribute of a great text-book, and no better tribute can be afforded it than by declaring it the most authoritative treatise on diseases of the heart in any language.

The Early Diagnosis of Tubercle. By CLIVE RIVIERE, M.D., F.R.C.P., Physician to Out-Patients, City of London Hospital for Diseases of the Chest; Physician East London Hospital for Children. Duodecimo; 260 pages. London: HENRY FROWDE and HODDER & STOUGHTON, 1914. Price \$2.00.

Though small in size, an extremely large amount of useful information is contained in Dr. Riviere's book. The author presents in a concise manner all the newer adjuncts used in making an early diagnosis of thoracic tuberculosis, and as he is able to speak from a very large experience, his commentaries and conclusions are worthy of careful note. The largest part of the book is taken up by a consideration of pulmonary tuberculosis in adults and the clinical and special tests used in its diagnosis. The last quarter of the book is devoted to pulmonary tuberculosis in children, especially to disease of the bronchial nodes.

The book is thoroughly up-to-date; subjects such as quantitative cutaneous tuberculin test, albumin reaction of the sputum, Gram-Much staining and pulmonary radiography are all freely discussed. It is not often that the reader gets so clear and well-presented a conception of the subject of diagnosis of tuberculosis, and we believe that this little volume may be most highly recommended.

Diagnosis in the Office and at the Bedside. The Use of Symptoms and Physical Signs in the Diagnosis of Diseases. By HOBART AMORY HARE, M.D., Professor of Therapeutics, Materia Medica and Diagnosis in the Jefferson Medical College of Philadelphia. *Seventh edition.* revised and rewritten. Octavo; 547 pages; 164 engravings and 10 full-page plates. Philadelphia and New York: LEA & FEBIGER, 1914. \$4.00, net.

The subtitle of this very practical and excellent work indicates its character. It consists essentially of a de-

scription from the diagnostic standpoint, under each symptom or symptom-group, of the affections marked by that symptom or regional lesion. The work follows therefore the mental processes that one actually employs in bedside diagnosis. Laboratory diagnosis is not included, but all the methods of clinical diagnosis are considered in their appropriate applications.

A Synopsis of Medical Treatment. By GEORGE CHEEVER SHATTUCK, M.D., Assistant Physician to the Massachusetts General Hospital. *Second edition.* Duodecimo; 96 pages; interleaved; pasteboard cover. Boston: W. M. LEONARD, 1914. Price \$1.25.

This outline of treatment is based on methods that have been employed at the Massachusetts General Hospital. It is a useful condensation or framework.

Progress in Surgery

A Résumé of Recent Literature.

THE MEETING OF THE AMERICAN SURGICAL ASSOCIATION.

New York, April 9th, 10th, 11th, 1914.

President, W. M. J. MAYO.

(Next Meeting in Rochester, Minn., 1915;

President, GEORGE ARMSTRONG, Montreal.)

ADDRESSES OF SPECIAL NOTE.

First Day.

THE PROPHYLAXIS OF CANCER was the subject of W. J. Mayo's presidential address. Briefly considered, the points made were as follows:

Local lesions constitute an invitation to the development of carcinoma.

Between benign and malignant growths there are midway lesions in which the cells are changed but there is no invasion of the surrounding tissues.

Local lesions upon which cancer may develop may be divided into three classes:

1. Congenital neoplasms.

2. Trauma. Both carcinoma and sarcoma have been known to develop within a short time after the infliction of a trauma.

3. Chronic irritation. The well-known examples were cited of the carcinoma of the floor of the mouth in the natives of India who habitually carry a mass of acrid betel-nut leaves in this location, and carcinoma of the abdominal wall at the site of burns caused by the Kangri stoves of Thibet.

To these examples of precancerous lesions upon the surface of the body were added analogous examples of lesions occurring in the mucous membranes lining the various hollow viscera. Unfortunately such precancerous conditions give few symptoms.

Gall-stones and carcinoma of the gall-bladder are both frequent in the female. The mortality in operating for gall-stones in early cases is one-half of one per cent. at the Mayo Clinic. There were no cures in the diagnosed cases of carcinoma of the gall-bladder. There were some cures in the early non-diagnosed cases. (Early cancer in thickened sclerosed gall-bladder containing stones.)

Carcinoma of the stomach. In animals (rats) it has been observed that carcinoma of the stomach followed the habitual eating of irritating foods (cockroaches), but did not occur in those animals fed with non-irritating substances. In over 50% of the cases of carcinoma of the stomach observed at the Mayo Clinic the history pointed to the existence of precancerous lesions. In civilized man carcinoma of the stomach is a disease whose frequency is steadily increasing. A comparative study of the life habits of civilized and uncivilized men might perhaps shed some light upon the subject. For example, the meat consumption of civilized man has increased five-fold within the last century. (This mark was misconstrued by the reporters to mean that the eating of meat was a cause of cancer of the stomach.)

for hemolytic icterus made excellent recoveries, gaining from seven to twenty-four pounds. Of five cases of pernicious anemia in which the spleen was removed, one died of pneumonia, four improved markedly. Three, previously bed-ridden, could walk again and all gained some weight. Of the nine patients whose spleen had been removed for Banti's disease, seven were quite well. The oldest operation was two years ago. Three other cases were operated upon for splenomegaly following an indefinite type of chronic sepsis. Practically the same report appeared in the last number of the *Zentralblatt für Chirurgie*, 1913, page 204.

FINNEY reported three splenectomies, two for pernicious anemia, one for Banti's disease. All three patients did well.

INTRAVENOUS ANESTHESIA: Report by KÜMMELL, of Hamburg. In 6,000 operations a year intravenous anesthesia was used in 300 selected cases. There were special indications. First, topographic, i. e. in operations upon the head, especially the mouth, tongue and hypophysis. Second, in debilitated patients, especially those suffering from carcinoma, sepsis, shock, or exsanguination. (In a hundred operations for ectopic gestation all were saved.)

With proper technic there should be no fear of local thrombosis or consequent embolism. To avoid local thrombosis there should be a continuous gentle flow of salt solution through the canals into the veins. The effects of intravenous anesthesia upon the kidneys, lungs and heart are no worse than those of general anesthesia. In Kummell's Clinic two litres of normal saline solution are administered intravenously after all severe operations.

Technical Details: There is a stand holding three containers, one with normal saline solution, one with 5% ether in normal saline solution and one with isopral. Anesthesia sets in within one and a half to ten minutes after it is begun. As soon as the patient is well under, the administration of the ether solution is stopped, and a gentle stream of salt solution keeps the blood in motion past the canula. In very powerful or in alcoholic patients isopral is employed to initiate the narcosis which is then continued with the ether solution.

Amount of ether used: Eighty-seven grams of ether were used for maintaining anesthesia during resection of the cardia for carcinoma, which took two hours. Three litres of fluid and sixty grammes of ether were used in the operation for aneurism of the descending aorta referred to above. In tuberculous cases the intravenous anesthesia has no disadvantages. The rapid awakening and rarity of vomiting are additional advantages. (Isopral is used in one and one-half per cent. solution.) Veronal is untrustworthy for this purpose. Hedonal is used by the Russians.

E WYLLIS ANDREWS, of Chicago, employs the intravenous anesthesia for operations of from three to six minutes' duration. He points out that the method has certain limitations. That five per cent. ether solution frequently fails to induce anesthesia and that ten per cent. is dangerous because of its tendency to leaking the blood and to thrombus formation. He believes with Kümmell that its employment is indicated in selected cases.

RADIUM IN MALIGNANT DISEASES. SPARMANN, of Von Eiselsberg's Clinic, in Vienna, reported on forty cases of inoperable malignant disease. The Eiselsberg Clinic owns 225 milligrams of radium and 150 milligrams of mesothorium. Both external and internal applications were made. At first large doses up to 11,000 milligram-hours were employed. Recently these have been reduced to 1,100 to 2,000 milligram-hours.

The hopes entertained at first were not realized. Eleven out of the forty cases only showed improvement and these were in superficially located lesions such as the tongue, the axilla and the skin. In some, recurrence was even hastened by employment of the radium. There is no specific action upon the tumor itself, only a local action.

ABBE, of New York, in the discussion reported employing radium for the past eleven years in over one

thousand cases and quoted several cures in superficially located lesions.

Sparmann, in closing, again stated that radium has been beneficial only in superficial lesions and that isolated examples of cures do not furnish sufficient grounds for making any general rules.

FOURTH TRIENNIAL CONGRESS OF THE INTERNATIONAL SURGICAL ASSOCIATION.

New York, April 13th, 14th, 15th, 16th.

President of the Congress, A. DEPAGE, Brussels.

President of the Association, CHARLES WILLEMS, Ghent.

(Next Congress, Paris, September, 1917;

President, WM. W. KEEN, Philadelphia.)

At the opening session addresses of welcome were delivered by Surgeon-General GORGAS, U. S. A., representing the President of the United States, WM. J. MAYO, president of the American Surgical Association, and L. L. McARTHUR, of Chicago, chairman of the American Committee of the Association, in place of Roswell Park, recently deceased. The address of the president of the Association, Professor WILLEMS, read, in his absence, by the secretary, J. P. HOGNET, of New York, was supplemented by an address of the presiding officer, Professor DEPAGE, also in French.

AMPUTATIONS, the topic of the first scientific session, perhaps suggested by the Balkan wars, were discussed in their various phases by WITZEL, of Bann; BINNIE, of Kansas City; DURAND, of Lyons; RANZI, of Vienna; DEPAGE, STEINTHAL, of Stuttgart; MORESHU, of Paris; PRANKE, of Braunschweig; LORTHOIR, of Brussels; LAMBOTTE, of Antwerp; RITTER, of Posen, and others.

In these papers and discussions, to consider them as a whole, especial attention was given to the means of providing painless, weight-bearing and serviceable stumps, and to the after-treatment. High section of the nerve trunk was emphasized as important by Wilms, and fixation of the nerve on the bone section was also recommended. In the treatment of the end of the bone were discussed the comparative indications of the methods of Bier (osteoperiosteal flap closure) of Wilms (closure by tendon flap) and of Hirsch-Bunge (removal of periosteum and endosteum). Bunge's method was considered best in military practice and in such other cases as cannot expect primary wound-healing. Steintal showed lantern slides illustrating conical stumps following faulty techniques, and painful osteophytes growing from redundant periosteum flaps. Binnie suggested free transplantation of a bone fragment to the end of the long bone as technically simpler than Bier's method. Witzel advocates an "extension overband", i. e. traction upon the dressing covering the stump rather than compression. This is maintained for ten days. Then massage is begun, active movement is made at the end of two weeks and the patient is encouraged to stand upon the stump at the end of three weeks. He should stand on it at the end of four.

The method of Vanghetti, viz., the preparation of loops of tendon covered by and lined with skin, was mentioned as of service in stumps of the upper extremity, to provide attachments for manipulating prostheses. Far better than this, however, is the remarkably ingenious Carnes artificial arm, demonstrated by Binnie on three men who had high amputations. One of these men had a stump of humerus scarcely two inches long, yet he, like the other two, by jerking his shoulder in various directions could make his artificial hand and fingers perform astonishingly, e. g., write, pick up a coin, seize and lift a satchel by its handle, pick up a cigarette and lift it to the lips, etc. The demonstration of this remarkable, and mechanically not very complicated, artificial arm was, we think, the most interesting and most impressive feature of the discussion on amputations.

Second Day.

In the symposium upon GASTRIC AND DUODENAL ULCERS, papers were read by DE QUERVAIN, of Basel (by title); HARTMANN, of Paris; LECENE, of Paris; W. J. MAYO, and PAYR, of Leipsic. Nothing new was brought out. Hartmann and Lecene stated that about 20% of callous ulcers

thigh. The upper fragment's end was readily exposed; this was drawn upward and outward by a bone hook. The end of the lower fragment was then easily exposed. Both fragments were grasped with the Lambotte bone-holding forceps. The limb was then linked at the site of fracture by an assistant (Dr. Turnure), the ends were exactly coapted and the limb was straightened out. A third clamp now grasped both fragments at the point of fracture, a plate was introduced into the wound and was accurately applied to the bone. (Lambotte's plates are oval and have a transverse concavity on cross section. This shape gives great strength with comparatively thin material. The screw holes are spaced at one-fourth inch intervals from one end of the plate to the other. The Lane plates of latest pattern also have this feature of multiple holes. The advantage of this is that it permits greater latitude in placing the screws to meet the individual requirements of the case.)

Instead of leaving the center clamp to hold the plate in place, Lambotte then reapplied the two original clamps in such a manner that they held the plate and retracted the soft parts to the upper side of the wound. Holes were drilled and his own type of self-tapping screws were then inserted. Large through-and-through sutures of silk roughly approximated the tissues. The skin margins were united by a running suture. The limb was put up in a retentive dressing (gauze next to the wound, then towels, then a bandage) in such a way that the knee was acutely flexed, the foot almost touching the nates. (Passive and active motions are begun on about the fifth day.) The operation was done with great neatness and celerity but without the slightest hurry. It was eighteen minutes from the incision of the skin to the driving home of the last screw; six minutes more were occupied for closing the wound—twenty-three in all. Every move showed the operator a finished technician.

The operation was so simple that the operator's crutch and lever for overcoming shortening and the plate-holding attachment of his most recent bone-holding forceps were not brought into play.

The versatility of Lambotte is phenomenal. His equipment allows one not only to plate, but also to bolt together the fragments of a comminuted fracture, to encircle and bind together the halves of a long oblique fracture ("cerclage") and to combine any of these methods with any other. He has many more resources at his command than has Lane.

Most of the foreign members of the International Surgical Congress left New York for Philadelphia late on Thursday, the 16th, for a brief tour of the East and Middle West, as follows: Friday, April 17th, was spent in Philadelphia; Saturday, the 18th, in Baltimore; Sunday, the 19th, in Washington. Late Monday, Chicago was reached. Wednesday and Thursday, the 22nd and 23rd, were spent at Rochester, Minn. From there the return journey began. After brief stops at Niagara Falls, Toronto, Montreal and Boston, the visitors reached New York late on Tuesday, the 28th, sailing for Europe the next morning.

Rupture of the Intestine, With Special Reference to Its Early Diagnosis. M. KAHN, Leadville, Colo. *Journal of the American Medical Association*, March 7, 1914.

Maurice Kahn remarks on the high mortality of intestinal rupture and the manner in which it may occur, and reports several cases observed by himself. The necessity of early operation is especially insisted on, as the surgical technic is fairly successful when early operation is performed. There is no better method of insuring the patient's death than masking symptoms by morphin and waiting for the absolute diagnostic signs of the injury. Hence he gives a detailed list of the symptoms. Shock varies from slight to most profound, and its absence signifies nothing. Vomiting is common, but not invariable, and the more persistent it is the more important. It is due to irritation of the peritoneum, which, when sufficient to cause it, may be long delayed, especially if the intestinal content is expelled directly into the pelvis. Obstipation

is very common, and is not so useful as a sign as we have it in the picture of traumatic or paralytic ileus. Frequent urination has been observed, but it is rare and a late symptom. Pain is usually intense, local or general, more often the latter. It appears early and continues unabated. The difference in patients enduring pain has to be considered in estimating this symptom. The respiration is said to be characteristic and of thoracic type and shallow. Kahn has not seen this early enough to be of value. If present it will be significant, but its absence means nothing. The pulse, at first, is usually slow and gradually and steadily rises, though exceptionally this is delayed. An increasing pulse-rate is a valuable symptom, but it may be too late. The temperature is but slightly elevated at first and not dependable for early diagnosis. Formerly the facial expression was considered of importance, but generally when it is noticed it is too late to be of value. Loss of liver dullness is also a late sign and may be simulated by a marked meteorism. Abnormal areas of dullness may appear from hemorrhage, but otherwise they would be tardy in appearance; as an early symptom local dullness is not of importance, as there would be other characteristic symptoms accompanying it. Rigidity of abdominal muscles is an invaluable sign in a suspected case and is not subordinate in importance to any other. Local tenderness is of great value if superficial injury can be excluded, and its increase in severity and area are rapid in cases of rupture. The longer the time after the accident and the more numerous and marked the symptoms the surer is the diagnosis and the greater the danger to the patient. Once the diagnosis is made, the importance of prompt action cannot be overemphasized. The history may be misleading, but it is still of primary importance, and with it the persistence of the initial symptoms, especially rigidity and pain, are sufficient at least to warrant an exploratory operation.

Spontaneous Rupture of the Spleen in Typhoid Fever, With a Report of a Case Cured by Operation. (Splenectomy.). L. A. CONNOR and W. A. DOWNES, New York. *American Journal of Medical Sciences*, March, 1914.

The patient, aged 36 years, was admitted to the hospital with what appeared to be a mild typhoid; the only unusual clinical feature was an unusually large spleen, which reached 4 cm. below the costal border. About the ninth day the patient complained of severe pain in the splenic region; this continued for a few days and then gradually subsided. The pain was not attended by any grave clinical phenomena. On the 12th day, following an attack of coughing, the patient was suddenly seized with severe pain in the left hypochondrium and shoulder; the patient's condition became worse, the pulse was rapid and small, the upper left quadrant of the stomach was rigid and tender and there was dullness in the left flank. A diagnosis of rupture of the spleen was made and about five hours after the onset of the symptoms the spleen was removed. A tear in the capsule about three inches in length was found and the abdomen contained about a quart or two of blood. The patient did well and was discharged from the hospital five weeks after operation. An interesting feature of the case is the finding of a laminated clot on the surface of the spleen indicating that a rupture had taken place during the first attack of pain from which the patient had apparently recovered. The subsequent rupture was in all probability due to the attack of coughing. The report concludes with a study of all the previously reported cases of rupture of the spleen during typhoid fever.

An Anatomic and Physiologic Method of Short-Circuiting the Colon. J. R. EASTMAN, Indianapolis. *Journal American Medical Association*, March 17, 1914.

Eastman says that anastomosis of the caput coli at its lowest level with the rectum as a means of short-circuiting the large bowel presents all the advantages and eliminates many of the evils of the operative procedures now in use. Ileostigmiodostomy does not always drain the cecum, and while anastomosis of the terminal ileum with the rectum is somewhat more efficient, the pus formation at the blind end of the ileum, described by Werelius, may defeat the object of the operation and reversed peristalsis favor retention of fermenting food and bacteria. If the caput

sues. The authors' experiments, however, when accurate weighings of donor and patients were made, showed that while these sources of error may exist, in most cases they are not large enough to affect materially the results of the calculation. They say in conclusion: "1. It is as necessary to control the amount of blood transfused during a direct transfusion as it is to control the dosage in any other therapeutic procedure. 2. A simple arithmetical formula is given by which it is possible to calculate how much rise in the percentage of hemoglobin will be obtained by transfusion of a given volume of blood. The formula is:

$$\frac{[(\text{Patient's blood-weight} \times \text{patient's hemoglobin per cent}) + (\text{Weight of blood transfused} \times \text{donor's hemoglobin per cent})]}{[\text{Patient's blood-weight} + \text{weight transfused (in pounds)}]} = \text{hemoglobin per cent reached.}$$

"The patient's blood-weight is estimated as one-nineteenth of the body-weight. 3. The amount to be transfused may be decided arbitrarily, with regard to the patient's need, or with regard to the donor's ability to give up blood. 4. It is always safe to take one-fourth of the donor's blood; it is often safe to take as much as one-third of the donor's blood volume, provided the transfusion is not done too rapidly. 5. Though the danger of overloading the circulatory system of the patient is not as great as has been thought, yet probably it is not wise to add more than one-fourth, or at most one-third, as much blood as a person of the patient's weight normally has. This needs to be taken into account only in children or very small adults, transfused from large donors, because in most cases a single donor will collapse before he can give enough blood to embarrass the circulation of a full-grown adult patient. If more than one donor is used, this part of the circulation becomes of great importance. 6. By means of exact weighings of either donor or patient, or both, before and after transfusion, in a series of eleven cases, we have shown that the formula which they give corresponds quite closely to the actual amount of blood transfused. 7. By using this calculation as a guide and determining before each transfusion the point to which the hemoglobin ought to be raised, it is possible to avoid untoward symptoms in either the donor or patient. We have demonstrated this in a large number of transfusions."

A Study of the Pathology of the Thyroids From Cases of Toxic Non-Exophthalmic Goiter. Louis B. WILSON, Rochester, Minn. *The Journal-Lancet*, February 15, 1914.

The pathology of the thyroid in true exophthalmic goiter is essentially a primary parenchymatous hypertrophy and hyperplasia, i. e., an increased amount of functioning parenchyma associated with an increased absorption. The process is an acute one. The pathology of atoxic simple goiter is marked essentially by atrophic parenchyma, decreased function and decreased absorption. The process is a chronic one. The pathology of those cases of toxic goiter that resemble exophthalmic goiter is one of increased parenchyma through regenerative processes in atrophic parenchyma, or the formation of new parenchyma of the fetal type with an increase in each instance of secretory activity and of absorption. The nearer the cases of this type approach in age and symptoms true exophthalmic goiter, the shorter the duration of the period of goiter before operation, and the smaller the average weight of the gland at the time of its removal.

The cases of toxic goiter in which the symptoms are of the cardiovascular variety much more closely resemble cases of simple goiter in their pathology. A larger number of them is of the colloid type; the enlargement of the thyroid has existed for a longer period before operation, and the portion of the gland removed is materially larger than in the cases resembling the exophthalmic variety. All the above pathologic evidence points to a constant relative association of increased secretion and increased absorption from the thyroid, proportional to the degree of intoxication of the patient.

A Consideration of Our General Anesthetic Agents, Ether and Nitrous-Oxide-Oxygen. WILLIAM C. WOOLSEY, Brooklyn, N. Y. *Long Island Medical Journal*, February, 1914.

Only ether and nitrous oxide are considered since these are the anesthetics of choice.

Operative surgical shock may be etiologically divided into (a) that caused by anesthesia, toxemia direct and indirect, (b) that caused by hemorrhage or similar serious coincident factors of operative invasion, (c) that caused by the actual afferent nerve trauma of surgical procedure. If the second group be omitted, the author believes that 90 per cent of operative shock cases are really anesthetic shock. Many of these cases are due to faulty administration of the anesthetic. The commonest error is that of not permitting sufficient oxidation of the blood during administration of ether. Cyanosis ought not to be present; if it is, it points to obstruction of the entrance of air, at the base of the tongue, at the glottis, at the lips or finally in the trachea, where mucus or vomitus has collected.

The author believes that the question of dosage is much simplified by the use of the anethetometer, especially in institutions where comparatively inexperienced men are frequently being broken in as anesthetists.

Nitrous oxide and oxygen becomes a proper agent for general surgical narcosis only when it is utilized in one of two ways: (a) as an adjunct to complete local analgesia where only its most superficial effects are necessary, while the local anesthetic cuts off wholly the field of operation, or (b) where it is skillfully supplemented by enough ether to bridge over the more severely traumatic stages of the operation.

Roentgen Stereography in the Diagnosis of Urinary Calculi. E. W. CALDWELL and H. M. IMBODEN, New York City. *New York State Journal of Medicine*, March, 1914.

1. The only disadvantages of stereography of the urinary tract as compared with the ordinary single plate method examination are the increased technical difficulties and the greater expense. Accuracy in these examinations is of such great importance as to justify the increase in expense and in labor necessary for the stereoscopic method.

2. Stereography reduces to a minimum the errors from the following sources:

(a) Artifacts in the plates resembling stone which may appear in one plate but not in two in the same place.

(b) The mistaking of extra-urinary bodies for calculi.

(c) Overlooking the shadows of calculi which are superimposed on bone shadows, especially the heavy stones of the pelvis.

(d) The knowledge of depth and perspective which these stereoscopic examinations present gives confidence in the estimation of the size, outline and position of the kidneys.

Blennorrhic Processes, Especially in the Vagina of Children, Caused by the Diphtheria Bacillus. E. KOBRAK, Berlin. *Medizinische Klinik*, March 8, 1914.

The author describes several cases of inflammation of the throat in which only a severe catarrhal condition, without the presence of membrane, was observed, in which, however, culture showed diphtheria bacilli. These cases responded to antitoxin treatment. He then reports two cases of marked vaginal discharge in little girls in which examination of smears failed to show gonococci, but in which cultures showed profuse growth of diphtheria bacilli. Owing to the fact that these cases also quickly responded to treatment by antitoxin, the author believes that this type of vaginal infection in children should be looked for more often.

The Abderhalden Ferment Reaction in Carcinoma. (Ueber die Abderhaldensche Fermentreaktion bei Carcinom.) G. M. FASIANI, Turin. *Wiener Klinische Wochenschrift*, March 12, 1914.

Fasiani tested 64 serums. The reaction was positive in 95 per cent of the cancer patients and in 65 per cent of cancer-free patients. In four cases of sarcoma the reaction was negative. In view of these findings, the author concludes that the reaction is of little value.

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FURTHER EXPERIENCES WITH THE IN- VERSION METHOD FOR THE TREAT- MENT OF GIANT VENTRAL HERNIA*

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Since writing my paper a year ago upon "The Treatment of Large Ventral Hernia by Inversion of the Hernial Sac—With or Without Opening Into the Peritoneal Cavity," *New York State Journal of Medicine*, December, 1913, I have operated upon seven additional cases in which I followed the plan described in that paper.

Four of these cases were types of giant hernia, while the three remaining ones were simply large.

One of the former cases was complicated by acute intestinal obstruction; another was one with chronic obstruction to which semi-acute symptoms had been added. Both were in women weighing over 200 pounds, with very large hernia. The former case healed per primam with a perfect result; and the second one, although complicated with intestinal rupture, fecal fistula, extensive sloughing of the fascia, and fat abdominal wall, also recovered with a solid scar. This case is very valuable in that it shows that a cure may be obtained in extreme circumstances by this method.

With the experience of fourteen cases I can urge still more emphatically the use of this method for the cure of a condition that is one of the most trying that surgeons have to meet.

There were no fatalities. Primary union resulted in all but the case referred to above and one in my first series who had a superficial suppuration caused by scratching beneath the dressings. All are cured.

There has been no intestinal paralysis or obstruction due to increased intra-abdominal pressure or intestinal kinks. I can confirm my first statement that the added weight within the abdomen, combined with pressure on the abdominal wall, has not and has not produced respiratory or cardiac embarrassment.

As a rule, the peritoneum is not torn when the sutures are inserted without the sac is granted. Such contraindication opening into the sac will arise only rarely, and then a free opening, as is usual, or by one or two incisions only large enough to admit a finger into the peritoneal cavity, the mattress sutures may be safely inserted without danger to the intestine.

As stated above, I have shown that with a proper technique this method will withstand the test of an extensively suppurating wound. However, suppuration is to be prevented by every surgical precaution.

THE INVERSION METHOD FOR TREATING GIANT HERNIA.

I shall not reproduce here any argument for favoring this method over many of the others now in vogue, but shall merely briefly review the various steps, as published in my first paper.

Large elliptical incisions expose the sac, which, with the external fascia of the abdomen, is cleaned for more than two inches beyond the hernial orifice.

If the sac is to be left practically intact, the elliptical portion of skin must be dissected cleanly away. Usually, however, the portion of sac corresponding to the elliptical mass of skin is removed with the latter, thereby freely opening into the peritoneal cavity. Any complications found are dealt with in the usual manner.

In my experience, the intestine can be freed and any raw spot covered with omentum. Extensively adherent omentum need not be freed from the sac unless it seems to be exercising a deleterious traction on the intestine and stomach. The excess of omentum, usually very thick and adherent, may be trimmed off at a suitable point and the peritoneal cavity closed by uniting the edges of the sac, with this adherent omentum between, by a converging suture. No plain gut suture, though the stitch is sufficient to aretate omentum, is to be used.

Before the sac is closed, the lower row of the inverted suture is placed in the abdominal wall. The abdominal wall is then closed. Here, as elsewhere, the abdominal wall is to be closed for a distance of three or four inches, and about half an inch apart. The details of the operation are detailed in my first paper, and in the literature referred to.

*Read before the Association of American Surgeons, March 14, 1914.

first above and then below until all have been tied. I use three knots in all these sutures. By this first series of sutures the bulging mass of sac (and also the omentum, if present) is inverted into the abdominal cavity. A second row of the same suture material is placed one inch outside the first row so as to "break joints."

Retention sutures are next inserted. These are introduced through the skin from two to four inches from the margin of the incision. They are placed not more than two inches apart and in a figure-of-eight manner, taking a deep bite into the fascia. When tightened they invert the last row of kangaroo sutures and take all the initial strain. They should be selected with regard to the particular case. The very largest hernia require either double strands of bronze wire, gauge No. 30, or



Fig. 1. Diagram of Case VII, showing the type of hernia under consideration.

single strands of a medium-sized twisted wire cable. In the smaller herniae double strands of silkworm-gut or Pagenstecher's linen may be used. All these sutures are doubled for a purpose. If one breaks the other is strong enough to hold; and, doubled, they do not cut so fast through the tissues. I used chromic gut in case XII. The result was perfect, but the gut absorbed at the end of ten days and I was anxious for the next week. These sutures are tied over rolls of gauze half an inch thick so as to afford a broad surface for traction and not necrose the skin from the pressure.

A drain of rubber tissue is laid over the retention sutures and the skin is closed by plain gut, Pagenstecher thread, or silkworm gut. The material is unimportant.

The drain should not be disturbed for three days.

It is then withdrawn for an inch, and this is repeated every other day until it is entirely removed. These cases ooze a great deal of serum. Do not irrigate the drain tract, nor remove the drain to insert another. Infection is possible. Leave the drain as long as there is a free exudate of serum, and remove it gradually as this ceases. Keep the retention sutures tight. I usually tighten them up at the end of five or seven days, and remove them from the 10th to the 14th day after the operation.

Following the operation, a pint of normal saline solution is given per rectum every four hours day and night for 24 or 36 hours. Morphine, from $\frac{1}{8}$ to $\frac{1}{4}$ grain with eserine salicylate 1/60 to 1/40 grain, is given if necessary once or twice during the first 24 hours.

These patients have no more pain than the average patient after laparotomy. The urine is drawn every six to ten hours as necessary. The patients are turned every hour from side to back and to side, if not asleep. This plan I follow out in all my abdominal cases to facilitate intestinal peristal-

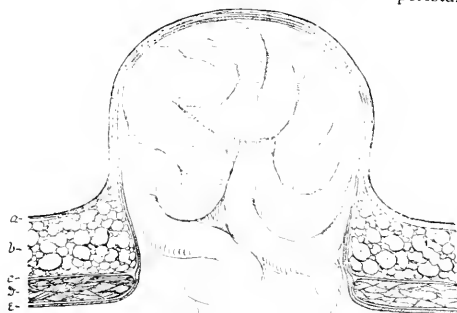


Fig. 2. A sectional view of such a hernia. The contents may be disregarded; the construction of the sac is the important feature. The different structures are lettered the same throughout: a. Skin, b. Subcutaneous tissue, c. External fascia covering the abdominal muscles, d. Muscular layer, e. Internal muscular fascia and peritoneum.

sis. These patients should be kept in bed about a week longer than the usual abdominal section. Their entire stay in the hospital is usually three weeks. Some I have allowed to go home in two weeks under favorable circumstances.

An abdominal belt is used in the majority of cases. I do not feel that it is a necessary part of the treatment, but it gives the patients comfort until the muscles resume their normal function.

CASE VIII:—Mrs. M., aged 55, patient of Dr. Boynton, with whom I operated to demonstrate the inversion method for hernia. Admitted to the Red Cross Hospital, April 22, 1913; discharged, cured, June 29, 1913. The patient is an extremely stout woman, with an immense abdomen. Thirteen years ago she was operated upon for an umbilical hernia.

and the post-larval stages of the larva. The larva of the fish was found in the stomach of the fish.

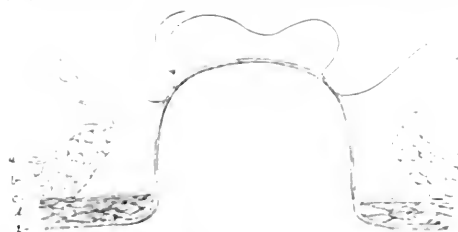
The larva was found in the stomach of the fish. It is probably a young fish. It seems to be an intestine and omentum.

By two long elliptical incisions the large lateral sac was exposed. It was found that there was a large lateral opening two inches in diameter with two or three smaller lateral protrusions through a weak scar-like wall so that the entire area over six inches long and two inches wide had to be incised. The sac was opened to free the adjacent intestines and omentum. In this step a loop of intestines was torn rough and the rent was closed with Pagenstecher thread. In spite of the care used this accident retarded the wound. This case is interesting as it proved that a cure was possible even in spite of such a condition as will be described shortly.

The cases of myoma, metastases, aden, and small intestine, with the stump of the omentum, were removed to the laboratory.

Myoma of the stomach was carried out with the modern method of surgery. A reliable was used for the local anesthesia and the skin was cut. The tumor was removed and the skin was closed in the usual manner.

The fish was then treated with a local remedy followed by the long delay of several weeks.



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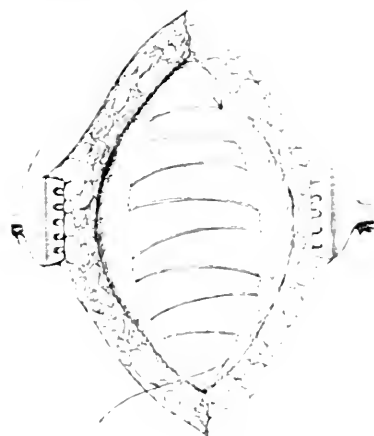
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the right side, which has developed since the operation detailed above for the post-operative hernia. (Dr. Marx had operated some few years ago for an indirect inguinal hernia on the left side. The result was a perfect cure.)

Through the last opening into the abdominal cavity an opportunity was given to examine the scar resulting from the inversion operation. It was solid and six inches long. The peritoneum was smooth and neither intestine nor omentum was adherent. The result was a perfect cure of the ventral hernia.

CASE X:—Mrs. R. W., 42. Admitted to Red Cross Hospital, May 20, 1913. Discharged, June 12, 1913. Large, stout woman. Has had five children.

Nearly two years ago was operated upon for lacerated perineum with complete prolapse of uterus.

Three months later noticed a small lump at right side of scar. This has grown steadily and rapidly

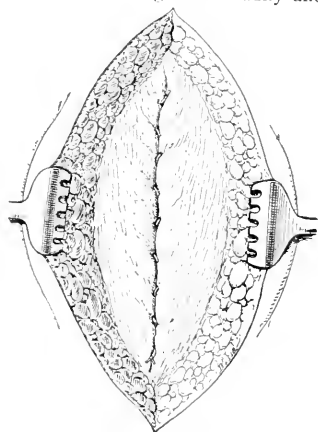


Fig. 5. Represents the appearance after the first suture has been drawn tight.

until now it is a mass as large as a child's head and projects through an orifice six by three inches. Has no pain and bowels are regular.

Perineum firm, uterus normal in size.

Operation, May 21, 1913. Gas and ether. Dr. Fletcher, Assistant, Dr. Boynton.

Elliptical incisions enclosing the hernial sac, eight or nine inches long. Sac exposed and fascia of abdominal muscles carefully cleaned for two inches distally from the hernial orifice.

Sac opened to admit one finger and kangaroo tendon mattress sutures easily inserted, taking up a bite three-fourths of an inch wide and deeply into the margin of the orifice. These were placed half an inch from each other. There were no adhesions of omentum or gut to the sac. The small opening in the sac was closed, the sac inverted by tying the mattress sutures and a second row of kangaroo tendon sutures placed to invert the first row.

Three double silkworm-gut retention sutures

placed in a figure-of-eight manner and coming out through the skin four inches from the margin of the incisions.

Rubber tissue drain, deep skin suture of plain gut and superficial of Pagenstecher thread. The operation was finished by tying the double silkworm gut retention sutures over rolls of gauze.

Bowels moved on the third day after the operation and daily or every other day thereafter.

The patient was out of bed on the 21st day and left the hospital the following day.

Examination, June 19th, showed a perfect result.

Patient seen in December and stated she was "perfectly well."

CASE XI:—Mrs. J. B. C., patient of Dr. Arthur, Plattsburgh, N. Y., June 25, 1913. Strangulated umbilical hernia. Aged 65. Large, strong woman, weight 230, mother of eleven living children and seven dead, youngest 20 or 22.

She had an umbilical hernia for 20 years; during the past five years it has been irreducible and gradually growing larger. She has worn a large plate truss over the hernia for the past five years.

The bowels have always been obstinately constipated. They never move without a strong cathartic and with a great deal of pain. Has never been free from pain or distress in the hernia. She has had several attacks of strangulation before when she had to go to bed for from one to two weeks, with pain, vomiting, distention, fever and chills. Has always been able to get the bowels to move after

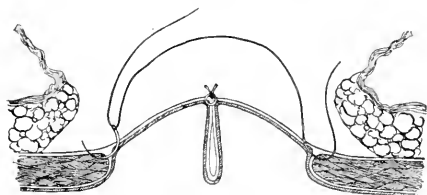


Fig. 6. A cross section to show the infolding produced by the first suture and the placement of suture No. 2. While the needle is represented as being inserted at right angles to the hernial margin in reality it is introduced parallel with the margin of the hernial opening and bites deeply into this margin.

hard work with enemas and cathartics. About two years ago had a very severe attack and operation was urged but refused.

This present attack began the 21st in the usual way, after eating a hearty meal. It was more severe than usual. She has vomited excessively and fecal matter on the last day. For the past 24 hours has been regurgitating thin, watery, black fecal smelling fluid, a mouth full or more at a time every little while. Bowels have not moved nor has she passed gas since the attack began. The pain in the abdomen and especially in the hernia has been severe. Temperature not greatly influenced. The pulse is about 90.

Examination: Large, stout woman, skin very dusky and muddy, tongue dry and coated in middle, edges moist. Fecal odor about mouth. Hernia, umbilical, sac irregular, lumpy, about six inches in diameter; tense, tympanitic in spots and hard

ficial means that I deem it justifiable to make this extended note upon the case.

CASE XII:—Mr. A. O'T., aged 38 years, Harlem Hospital, admitted September 13, 1913. Discharged October 9, 1913.

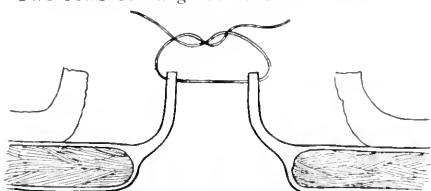
Two and a half years ago was operated upon for a ruptured appendix with abscess. Wound had to be drained for a long time and healing was slow. Patient was under treatment for two months.

Present trouble began three months ago when he noticed a swelling in the scar. This has been rapidly growing larger, but gives no trouble except from its size.

Examination shows a large protruding abdomen with weak abdominal walls. There is a long oblique scar across the abdomen at the right of the umbilicus. This scar is over a large, irregular, ventral hernia which has numerous extensions. Most of the hernia is reducible and there are two or three orifices felt leading into the abdominal cavity.

Operation, September 20, 1913. Two incisions about eight inches long enclosing an elliptical mass of skin and sac were made and the enclosed mass excised. This disclosed a hernia through a gap five inches long and two inches wide, with the omentum and intestines adherent in several places to the sac. The omentum was excised, the intestines dissected free, and the raw surface covered with omental flaps. The edges of the sac with the excised omentum in between were sutured together with interlocking sutures of No. 2 plain gut doubled.

Two rows of kangaroo tendon mattress sutures



(The figures 9 to 12 inclusive show the adaptation of the method to the case where the sac has been opened.)

Fig. 9. The introduction of the first suture.

rolled in the margins of the hernia and the adjoining edges of the abdominal wall for more than an inch. Four retention sutures of double strands of silkworm gut placed in a figure-of-eight manner were inserted at a wide distance from the skin incision and still further inverted the fascial margins. The skin was closed by plain gut over a rubber tissue drain.

The drain was removed entirely, at several stages, by the 29th. Primary union. The retention sutures were removed on the 13th day after the operation. Patient was out of bed on the 16th and discharged cured with a solid scar on the 19th day after the operation.

The highest temperature was 100.8° on the fourth day after the operation. The bowels moved every day, including the day of operation, until the patient left the hospital.

February 28, 1914.—Seen by myself. Scar is eight inches long, perfectly firm. Man works every day as a flagman and switchman. Feels perfectly

well. Bowels have acted normally every day. Says he feels fine.

CASE XIII:—Mr. J., 50 years of age. Red Cross Hospital. Admitted October 14. Discharged October 29, 1913.

Was operated upon 15 years ago for an attack of appendicitis.

About two years after the operation patient suddenly felt something give away in the region of the wound and since that time has been suffering more or less with stabbing pain more or less severe.

Examination shows a post-operative ventral hernia of moderate size, four inches in length by two inches wide.

Through two six-inch incisions the steps of the inversion method were carried out. The sac was opened and the intestines were found non-adherent to it.

Suturing done as described in other cases.

Bowels moved on the fourth day and daily thereafter.

The retention sutures were removed on the eleventh day after the operation; he was out of bed on the 13th day and left the hospital on the 15th day.

February 16th, 1914.—Scar seven inches long, perfectly solid.

Bowels are regular and normal. Works every day and feels "perfectly well."

CASE XIV:—Mrs. A., aged 36. Harlem Hospital, December 13, 1913. Housework.

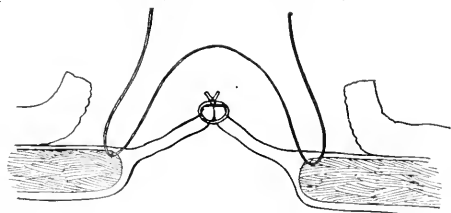


Fig. 10. The closure of the hernial sac and the introduction of suture No. 2.

Has had two children, full term, normal delivery.

In 1902 was operated upon at one of the city hospital for "internal trouble," and six years later was again operated upon for some abdominal trouble.

Appetite poor, bowels constipated. Frequent nocturnal urination. Habits good.

During the past three years has marked a swelling in the left lower part of the abdomen, which has steadily increased in size. This pains her occasionally, but she has never had attacks of vomiting. Examination is negative except for a large ventral hernia at the site of an abdominal scar between the umbilicus and symphysis. This is about the size of two fists and at the left of the midline.

Diagnosis: Ventral hernia, post-operative, of the dissecting variety. It is easily reducible and there is an orifice one and one-half by two inches.

Operation, December 16th. On exposing the hernial sac by two elliptical incisions six inches long a typical dissecting ventral hernia with several chambers was found. The sac was opened in one

MASSAGE AND MOVEMENTS FOR CERTAIN AFFECTIONS OF MUSCLES AND LIGAMENTS.*

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New York.

In urging a broader field for massage and movements, I would emphasize that they are not a cure-all, but are valuable aids for certain conditions. Their earlier neglect gave a sound plank to the rotten ships of charlatanism and cults, from bone-setters to their modern representatives. In abandoning certain patients to that chance fate, are we not leaving undone some of those things we ought ourselves to have done?

On a visit to the clinics and hospitals of New York City where massage and passive movements are used, it was pleasing to see so much good work being done, with the rapid growth of the applications of physical therapy in the last few years, even months, or weeks. Especially was this true of some orthopedic and neurological institutions. It is, however, surprising that priority so limits massage to the treatment of fractures in our surgical clinics, in spite of the fact that massage, "a kneading," is essentially adapted to muscular structures and accessible ligaments, which offer a great field—as do also some disturbances of the digestive tract, peripheral nerves, etc., not germane to this paper.

Massage is mainly manual and should naturally interest surgeons, who work with their hands; even a little practice giving increased delicacy and firmness of touch and the ability to detect indurations or atrophies of muscles, tender points of spinal exit or peripheral distribution of nerves.

Massage is rarely taught in our colleges, which results in indifferent knowledge and interest, restricts the physiological application, tends to make it a last, rather than an early, resort, and delays the standardization of masseurs. Some of us may not have even read one good book on the subject, as that of Graham, Dowse, Kleen, or Despard.

It is well known that muscle and ligament affections are often precursors of deformity, notably the deformities of flat-foot, lateral curvature, post-infantile paralysis, etc. Pre-deformity is a natural branch of prophylactic surgery, whose growth should emulate prophylactic medicine. When thousands of surgeons, instead of comparatively few orthopedists and neurologists, efficiently treat muscle and ligament affections, intractable deformities will be much rarer.

The importance of massage and movement for

impaired nutrition or function of muscles and ligaments is the basis of this paper. In health, function and nutrition go hand in hand. Injury or disease, in interfering with one, impairs the other. The muscles have been termed the peripheral heart. In contraction, the serum is squeezed from the lymph spaces to the lymph channels, from the capillaries to the venules and veins. Most lymph vessels and veins having valves, their contents when centripetally advanced, cannot return. On relaxation, fresh blood and serum are supplied, and nutriment is given, excrement having been removed. The ligaments in functioning, aided by adjacent tendons, act similarly, but passively.

Each massaging hand, about the size of the heart, has been compared to a peripheral heart, and stimulates muscular contraction. Passive motion more affecting ligaments and tendons parallels their function. Active and free motions combine the benefits of both.

Thus briefly do massages and movements aid impaired nutrition and function, hasten repair, and break the vicious cycle of injury, or disease.

One warning: massage is contra-indicated in acute infection.

In this short article I can only mention certain conditions and cases, but let us apply what we have to:

First: Traumatism of ligaments and muscles.

Second: Function and nutrition of muscles (general and local).

Third: Disturbed innervation of muscles.

Under traumatisms considering:

- (a) Contusions.
- (b) Ruptured muscle fibers.
- (c) Myositis; and,
- (d) Sprains.

(a) *Contusions*.—On receiving a blow the first natural impulse is to rub the part. Nature is right. Continued gentle centrifugal stroking obviates sensation, and tends to remove the effused serum or blood, to prevent congestion and swelling, interfering with the return circulation; while with diminished or abolished tenderness, kneading gives nutriment for repair of the damaged tissues. As we all know, the tender point of a contused ligament is often persistently annoying; massage for this will bring prompt relief. So it will for contused muscles, with or without ruptured fibers. Here, tenderness may be exquisite, making it necessary to proceed very slowly and gently, with repeated treatments, but the results are most pleasing, as the following recent cases illustrate:

Mrs. T. E., four weeks previous to coming to the

*Read before the Surgical Section, N. Y. Academy of Medicine, March 6, 1914.

friends. The right ankle was found to be very tender and much swollen. There were effusion in the joint and points of exquisite tenderness over the external lateral ligament, with sickening pain, when it was put on the stretch. The patient was hardly able to put the foot to the floor and unable to bear her weight upon it. Diagnosis, sprained ankle, especially of the external lateral ligament. Massage, followed by passive movements, were given. The patient was sent home to bed, where another treatment was given that night and the next day, when she was told to return to the clinic, which she did the following day, walking without perceptible limp. Massage, passive and active motions were again employed, and as the patient felt perfectly well, the ankle was strapped to afford good union to any ruptured fibers, and protect against subsequent injury. She was told to return in two or three weeks for removal of the straps and final examination. As she was cured, she later removed the straps herself, and it is interesting to note that the intermediate day being a holiday, by this treatment only a part of two days was lost from her work, a real consideration to herself and her employer.

J. L., one week before coming to the clinic, while playing basket ball, stepped on another's foot and wrench his own. A few days later he found difficulty in walking, which steadily increased, so that, as he expressed it, he was almost dragging his foot when he came for treatment. There was a tender spot over the external aspect of the fifth tarso-metatarsal joint with pain on putting the ligament on the stretch. Diagnosis, sprained tarsus.

Massage and vibration were applied, and the foot strapped. He was told to report three days later. This he did, though feeling perfectly well, so no treatment was given. Later he removed the straps himself, and despite being on his feet nearly all day every day, he has felt no discomfort since.

E. H., sprained wrist, with effusion in the joints similar to my own, cured in four treatments.

F. P., sprained elbow, similarly cured in two treatments.

These few citations show sprains completely cured in usually about as many days as weeks were required by rest treatment. Strapping, in allowing function, was a great advance, and massage, in aiding both nutrition and function, is its natural complement, and is always an advantage preceding, or with strapping.

The advantage of prompt treatment, as diminishing the time required for cure, is also shown. Slight tarsal sprains often become worse without treatment, paralleling weak-foot.

II. NUTRITION AND FUNCTIONS OF MUSCLES.

(a) *General effects.*—Zabludowski found in man that after severe exercise a rest of fifteen minutes brought about no essential recovery, while after massage for the same period the exercise was more than doubled, showing prompter recovery from fatigue.

Professor Maggiora of Turin also showed that muscles concerned in a special movement could do twice as much work after a few minutes' massage, as without it, *i.e.*, increased power for sustained exertion. The details are given by Graham. The voluntary muscles should comprise about half the body weight, and receive one-quarter the amount of the blood, so that the profound secret of their well-being on the general system is readily inferred. The medical aspects may not interest us, but Pool has recently shown the benefits of certain systematic exercise in post-operative treatment, and quotes Kleinschmidt, Krecke, and Henle as similarly advocating exercises and massage. It would seem reasonable that they might also be of value in the pre-operative or preparatory treatment of certain cases.

Its effect in impaired development and function of muscles may be shown by the case of

B. D., ungraded school boy of ten, referred by Dr. W. B. Noyes, of the neurological department, with a diagnosis of cerebral and cerebellar diplegia, manifest in impaired brain and muscular function, whose case must be summarized. He was constantly falling down, went upstairs one step at a time, would drop any bundle he attempted to carry from weakness of hands and arms, and was dropped from school as dull and undisciplined.

He was a thin, rather pale, dull looking boy, small for his age, with high arched palate and very irregular teeth, articulation difficult and indistinct, extremely small, flabby and weak muscles throughout, of weak, uncertain gait, weak hands and arms, some joints of fingers capable of great hyper-extension, lack of muscular development being especially evident. Now (about three months later) his color is fairly good, he looks much brighter, especially in his eyes, has gained flesh, and his muscles have gained in size and consistency. He walks steadily, runs well, goes upstairs normally without even grasping the balustrade, can carry bundles of considerable weight a reasonable distance, as about ten pounds half a mile, and lays them down when tired. He talks much more distinctly and his mental condition seems somewhat better, showing both muscular and general improvement.

(b) *Local effects.*—In health there is a state of muscular equilibrium of opponents; this is maintained, within limits, by extra work, giving extra nutriment and causing muscular development of the weaker. But beyond these limits in impaired nutrition and function, the weak relaxed muscle becomes stretched, with further impairment, in the opponent contracted ligament contracture follows, and even bony deformity. Likewise in poorly nourished, over-stretched ligaments, nutrition is hampered, and diminished function with pain may result. Massage may aid relaxed muscles to regain their tone, especially when over-stretching is pre-

scription in his anterior poliomyelitis articles were seen after writing the above; brevity leads us to let ours remain, giving due credit, and accepting responsibility for differences.)

In practice the rule holds that peripheral lesions, with restored conductivity, are more amenable than central ones, as is evident in birth palsies; but reasonable promptness in hemiplegia may save starving tissues.

Mrs. G. is an instance of function aided by massage after restored peripheral continuity. Briefly, she ruptured the right brachial plexus by falling out of a window December 18, 1912, the arm, forearm, and hand being almost completely paralyzed. She came to me six weeks later, when a diagnosis was made and Dr. Alfred Taylor sutured the nerves at the Neurological Institute; there was some massage given, but the patient became discouraged and gave up treatment. Hearing of this October 15 she was sent for and function found practically the same as before operation, but with massage she now uses all the muscles, cooks and dresses herself, the main weakness being in the deltoid.

In cord lesions, though, there are very pleasing results from newer treatment and the educative exercises of locomotor ataxics, etc., massage and movements are very helpful.

Affects of anterior poliomyelitis on muscles and ligaments better illustrates results of massage and movements, as shown in hundreds of Lovett's cases and those of Fraser of Rockefeller Institute soon to appear, including management of the early stage. However, as one of my cases is of ten years' standing, and an indication of methods in late stages might be of interest, I would summarize them in closing.

In 1903, feeling that the brace, while endeavoring to prevent deformity, so severely interfered with function and nutrition, as to be generally unsatisfactory, I determined to substitute massage and function, endeavoring to foresee and obviate deformity by any other means possible.

This was done in the case of Lena B., age then five, of Waquoit, Mass., who was brought to me September 15, 1903. She had never been ill until two years before, when she had a chill, followed by fever, which lasted some days. Her legs were then found to be paralyzed and tender on pressure, though sensation was diminished, for about seven weeks. A diagnosis of anterior poliomyelitis was made, and she was brought to New York and treated at the Hospital for the Ruptured and Crippled Out-Patient Department with electricity for three or four weeks, with improvement, and a brace was fitted, after which her parents took her to Waquoit. In 1903, she was wearing the brace and I was consulted.

Examination showed three-fourths of an inch

shortening of the left leg, with atrophy of the leg and thigh. Drop-foot was present so that the toe was dragged in walking with some inversion of the foot. Weak-foot was not apparent. The brace was removed, a laced shoe raised three-fourths of an inch was ordered (and this never had to be raised further). Massage twice a day with active motion and exercise ordered, and under this treatment there was steady improvement. The muscles developed up to those of the other limb, though it was a year or two before she was able to run normally. She is now taller and heavier than her mother. She wears a thicker sole on the affected side, but otherwise is entirely normal, running, dancing, ice skating, etc.

Subsequent cases strengthened this belief, and developed methods, so that after the acute stage, we now teach the mother to give the required massage twenty minutes night and morning. It is given at the clinic three times a week, with first passive, later active and resistive movements and special exercises; natural exercise is encouraged as soon as possible.

Where advisable we strap against stretching, of gravity, or too strongly opposing muscles, to help obviate deformity without interfering with function, the guiding principle of this muscle-strapping being, from origin to insertion of the muscle, the resultant line of force being in the line of the muscle's fibers; or the same principle, as in ligament strapping.

Massage may be given through strapping, or the plaster may be dissolved by xylol, etc. In the lower extremity the peronei and tibialis anticus are so often affected, causing weak-foot, that lace shoes adapted to this, and in heavier children a foot plate, may be ordered, with weak ankles a leather ankle, or leather side supports in the upper of the shoe are also ordered and possibly a rubber ankle might aid. With drop-foot in young children, Fraser has suggested an elastic band sewed to the junction of vamp and upper and held above with sufficient tension to raise the foot by a straight garter; in older children we use strapping, and ingenuity may suggest better methods. In shortening of a limb, the proper shoe is raised sufficiently. In the upper extremity and elsewhere the same principles are applied, all cases being carefully examined for lateral curvature which, if present, is treated by appropriate exercises and massage.

When even these indications are met, it is often surprising how well the children will walk and even run, how long after the attack, even years, we find muscles recovering function, encouraging the belief that with increased skill braces will rarely or never be required and tendon transplants less frequently.

and the edges of the wound be permitted to gape before complete union has taken place. It is my opinion that both of these can be safely eliminated. In a paper presented a number of years ago (*Transactions of the Medical Association of Georgia*) I advanced the claim that catgut became a safe suture just in proportion as skin disinfection stops short of skin traumatism, and the present tendency to simplicity of preparation bears out this claim. A skin that is scrubbed, scraped, washed, and soaked in strong chemicals is not in shape to take care of any kind of suture. Gentle washing of soap and water and alcohol, and when perfectly dry painting with tincture of iodine, seems to be the ideal method, as seen at present. Perhaps a dry shave and application of tincture of iodine on the table gives practically the same results. This application I make upon the operating table, after which washing away the iodine with alcohol. I mention this because it is claimed by many that iodine should be applied some time before the patient reaches the operating table. Hundreds of cases have demonstrated that two minutes is long enough clinically, even though it may not be so theoretically. Skin thus prepared will handle catgut without trouble, provided the proper size is employed in the proper manner.

The second objection can be met by using chromicized catgut, and after trying various sizes I have for the past two years employed the 00 chromicized gut practically exclusively. This is smaller than almost any other suture, and at the same time has enough tensile strength to hold the edges of the wound in coaptation. It should be remembered that skin sutures are for coaptation, and not for existing strain, and should there be unusual strain, as in breast amputations and removal of growths, there should be relaxation sutures, and perhaps a little larger chromicized catgut for the skin edges. The 00 chromicized suture will resist absorption in the skin for from seven to ten days without irritation or reddening.

Much depends upon the manner of placing catgut sutures. They should not be too closely placed or too tightly tied. Personally, I much prefer the continuous running suture, passing somewhat deeply into the subcutaneous fat, and taken at intervals of from one-half to three-fourths of an inch. Such a wound can be made to lie in perfect apposition, and at the same time can be pulled apart at any point, thus allowing free drainage by direct transudation between the wound edges. The serum thus exuded in drying out in the gauze makes an ideal splint for supporting the wound and should not be

disturbed until healing is complete. Blood serum dried thus in the gauze makes a dressing practically impervious to air and water. With the exception of supporting sutures in abdominal incisions, all wounds in my experience for years have been closed thus with catgut. The deeper layers in abdominal incisions are usually brought together with the 00 chromicized catgut used in two strands, or a little larger size. In no wound does catgut behave more satisfactorily than in those in the scalp, though many have contended that it should not be here employed. In extensive incisions for operations upon the brain it has been my practice for years to use the continuous catgut suture, which does away with the necessity for ligating vessels in the scalp, at the same time permitting them to close perfectly under one dressing. In hernias, kangaroo tendon is used in the deeper layers, and catgut in the skin. The extensive suture lines of breast amputations are closed with catgut, and the dressing is usually removed from the sixth to the eighth day for the purpose of removing the drainage tube, in which time but little further dressing is required. Even scrotal incisions in varicocele receive the same treatment.

In conclusion, we may ask, how much does it not mean to the patient to know that no stitches have to be removed, no dressings changed, and that after being taken from the operating table, there are no more harrowing or disturbing processes to be put through? In the end, too, it means much less work for the surgeon, much less dressings for the hospital, and an ideal result.

THE SPECIAL VS. THE COMPLETE HOSPITAL.

With the "hospital unit" as our sole guide, the general hospital, with "a medical and a surgical side," and the special hospital, with its one-sided organization and its helplessness in the face of unexpected and complicated emergencies, pass muster as satisfactory hospitals; but, inasmuch as neither the general hospital which is composed exclusively of a medical and a surgical side nor the special hospital which is manned by a group of regional technicians, is prepared, in the treatment of its patients, to bring effectually to bear the combined resources of modern medicine, no hospital of either type should be created henceforth without a protest. And for the same reason existing hospital fragments, wherever and whenever possible, should be pieced together into whole and competent hospitals. —S. S. GOLDWATER in *The Modern Hospital*.

and 1 is pressed backwards, *i. e.*, through the counter-pressure the hand which holds the handle is relieved of work. At the same time the distribution of pressure, as indicated by the proportions of the lengths of the arrows, is favorable. One-half acts forwards on 2, and the other half, which is directed backwards, is distributed between 3 and 1 in the proportion of the lever lengths 2 to 3 and 2 to 1, so that 3 receives about one-third, and 1 about one-sixth, of the entire pressure. Figure 19 shows how counter-pressure is practically carried out. The counter-pressure instrument consists of a pressure plate which can be moved forward with one hand by means of a rod and a three-ringed handle. By turning the small lever *a* (Fig. 18), an automatic stop is inserted which causes the pressure plate to remain in any position required. This simple arrangement can be attached directly to the electro-scope by means of a light envelope, and admits of

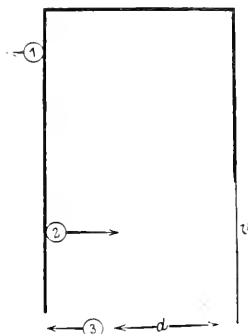


Fig. 17. After Brunings.

both the employment of the autoscopic spatula for adults and also of the spatula for children. In the latter case the pressure plate is simply turned upwards, so that its upper edge coincides with the end of the spatula. The method of using the counter-pressure instrument is illustrated in Figure 19, and, after what has been already said, requires no more explanation. The beginner is advised to carry out his first autoscopic attempts without counter-pressure, in order that he may acquaint himself with the difficulties of the older method, and be able to judge what degrees of pressure are permissible; for with the help of the counter-pressure instrument a simple movement of the fingers enables him to exert an extraordinary force, for which at first he has no proper measure. If, indeed, autoscopic after Kirstein's plan is often a trial of

strength on the part of the surgeon, so the counter-pressure method demands of him a corresponding sensitiveness of touch. The use of the counter-pressure autoscope does not in the first place differ from the normal procedure previously described. In the first stage the pressure rod must, of course, be completely withdrawn and, in the event of any difficulties of introduction, the pressure plate must be turned upwards. The second stage can only be carried out with some use of the counter-presser, which holds and directs the instrument. The beginner, however, is recommended to carry out the first part of autoscopic displacement without counter-pressure until the arytenoid cartilage is seen, and he has assured himself of the correct position of the spatula and knows how far to push it in, for only then will the pressure plate touch the right place, *i. e.*, the prominentia laryngis. It is obvious that all the rules applicable to the normal process of examination must also apply to the counter-pressure method. This applies also to the choice of a spatula of the right size, for the new method of examination is chiefly designed to make things pleasanter for the patient. I must now mention the advantages of counter-pressure autoscopic, which are partly capable of being mathematically demonstrated. For if the examination is first carried out normally with the dynamometric electro-scope, and the counter-pressure instrument then applied to its

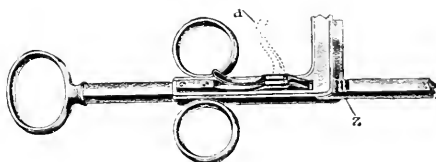


Fig. 18. After Brunings.

handle, a saving of pressure amounting to 40 to 60% will result. Only when much thicker spatulae are employed is the same amount of pressure necessary as was previously required. This is a great alleviation for patients who are difficult to examine, since it is just the second half of the pressure which causes pain. In cases where autoscopic is easy of application, the field of vision is considerably enlarged, because in such cases it is possible to work with a larger tube. It is an essential feature of the counter-pressure method that its advantages are greater in proportion to the desire to approach from the posterior laryngeal wall to the anterior commissure, and so inflict greater pressure of displacement on the individual. As regards indications for use, it follows that in very easy subjects the counter-pressure instrument may be used for

operation, demonstration, and briefly procedures, and in moderate or difficult cases it can be employed for laryngeal inspection. By this method I was able to remove a polypus situated in the anterior third of a larynx without cord, although previously not even the posterior wall could be brought into view with an 8.5 millimetre tube. As I had not yet reached across a base in Killian's clinical school, apparently to autopsy, it might almost be said that with the counter pressure method the applicability of a tube could be retained at 100 per cent. A few months after the introduction of direct laryngoscopy reports were made in the first laryngeal operations performed with this new method. Great larynx were held flat and soapy would introduce a new era in endolaryngeal therapeutics, because in this way they can be seen and reached directly. It is certainly a far better chance than if it is only visible as a reflected image in a mirror. This hope has not been entirely fulfilled, and the reason for this, as Kirschen had already remarked, is found chiefly in the fact that it is difficult to employ autoscopes and to operate at the same time. As a rule, two clavoids are required to bring the larynx into view, and if the instrument is to be used, one hand only, and that the left one, has to do all the work. This being the case, it is impossible to avoid pressing painfully on the teeth, and this makes the patient restless and easily spoils the view. If it is also remembered that the delicacy and fineness of movement of the right hand is considerably interfered with by the left hand being exerted simultaneously, then it is not surprising that even practiced users of the endoscope have hitherto preferred long curved forceps with the mirror to short straight instruments with the tube spatula. Soon after the introduction of autoscopes, various attempts were made to overcome this. Holding autoscopic spatula tubes. For instance, von Eicken had short tracheal tubes with both lateral windows for use with Kirschen's beaked trachea tube, and by this means he was able to present that part of the larynx which he wished to operate upon. I myself have worked on a similar principle "beaked tube," a half-open autoscopic tube with a bayonet-shaped end, which opens and closes the instrument in the throat without reducing the field of view. The beak tube has been very extensively used, and is of great practical utility for all operations in the posterior laryngeal wall, such as glottic caustic punctures. But it fails like all the auxiliaries, in cases of operations on the vocal cord, more especially in the region of the anterior commissure. The main obstacle to direct and laryngeal work is now

overcome by the counter pressure method. For, in addition to enlarging the field of view, it renders the presentation of the field of operation and the operation itself independent of each other, so that attention can be given to each of them separately, the latter. In spite of this there are still limitations to

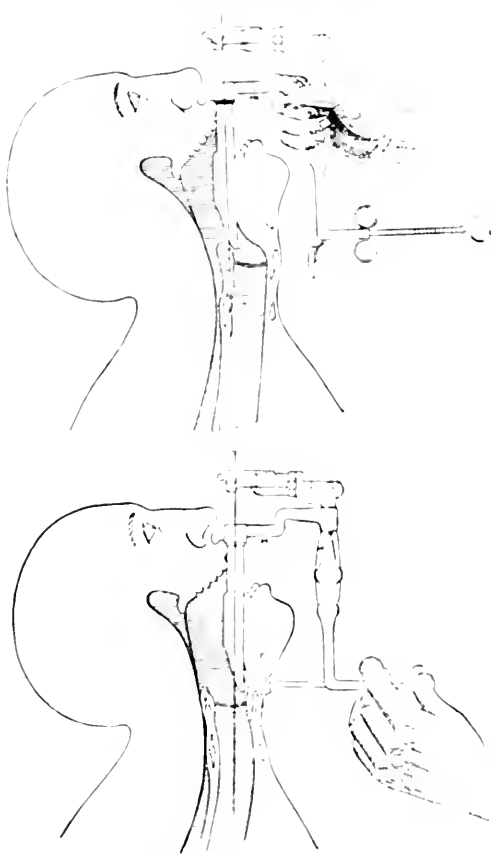


FIG. 1. The use of the endoscope in the larynx. (A) The use of the endoscope in the larynx. (B) The use of the endoscope in the larynx.

direct surgical work on the larynx which is helped in vain to overcome by means of a special operation autoscope. The chief limitations arise from two characteristic features of the examination. In the first place, it is impossible to exert any considerable degree of lateral pressure with the end of a long thin instrument introduced through a narrow tube. Secondly, the movements of the instrument in the direction of the tube are apt to be uncertain, be-

cause of the difficulty of judging depth with one eye only. As will be seen later on, it is possible to place against these unavoidable disadvantages such important advantages that direct operations have become an indispensable adjunct to the indirect method. I am accustomed to do the greater number of laryngeal operations by means of the counter-pressure autoscope. Foremost among the advantages is the immovable position of that part of the larynx which is presented in the tube, and the protection of the adjacent parts which is so desirable in cases where the galvano-cautery, local applications or x-rays are used. In the case of the galvano-cautery, which I employ mainly for "deep puncture" as recommended by Grunwald, "counter-pressure enables the surgeon to make the puncture exactly perpendicular to the surface. As is well known, the majority of tuberculous infiltrations, in the treatment of which deep puncture is strongly indicated, are found in the posterior part of the larynx in such a position that, by the indirect method, the instrument can only be applied in a more or less tangential direction. The cautery therefore always produces, apart from the uncertain depth of puncture, more extensive destruction of epithelium than when it is directed perpendicularly through the tube on to an operation field presented *en face*. For the application of other caustics (trichloracetic acid, chromic acid), autoscopy also affords the advantage of complete immobility and the absolute protection of the adjacent parts. For this reason the treatment can not only be localized in the most exact manner, but can be allowed to act for a long time without the other side of the larynx being touched. By this means I often try to promote the cicatrization of tuberculous ulcers if lactic acid proves to be ineffective, and also employ it for the bases of non-malignant growths after their removal (papillomas, pachydermias.) In the gradual progressive dilatation of laryngeal stenoses, the autoscopic method offers, in certain cases, advantages over the indirect procedure. It is especially advantageous in the case of young children, where it is impossible to use the mirror, and where the surgeon has consequently been obliged, hitherto, to introduce the dilator by feeling. As it is a question of overcoming considerable resistance, "bougieing" is only free from danger when controlled by the eye and this is rendered possible by the autoscopic method. For the stenosis treatment of young children, which is usually undertaken only after a previous low tracheotomy, I employ English urethral catheters, from the smallest size up to about 10

millimetres. The instrument is fitted with a stiff mandrin (either wire or steel wool carrier), and is then guided into the larynx, which has been previously cocaineized; it is best to pass the catheter by the side of the tube as otherwise it interrupts the view. As the catheter is not easily bent, it is possible for considerable pressure to be exercised in a longitudinal direction. After overcoming the stenosis the mandrin is drawn out, and the flexible catheter allowed to remain in position for an hour. A rubber tube drawn over the catheter prevents it from being bitten. As soon as a certain lumen has been attained, the catheter can be passed with "half-autoscopy." By this I mean the prelaryngeal presentation of the epiglottis, which has been already fully described. If the lower 2 or 3 centimetres of the mandrin have been bent, it is easy



Fig. 20. Counter-pressure autoscopy (with telescope)—after Brunings.

then to carry the instrument under the accurate guidance of the eye round the epiglottis. In this way the larynx is readily entered, and a considerable pressure can be exerted. By this process I have overcome almost complete stenoses of the larynx and of the subglottic space, although this only succeeds where the stenosis is very short or diaphragmatic in form. The treatment must be extended, with increasing intervals, over a period of one year or more. In adults, autoscopic dilatation only comes into consideration for very narrow diaphragmatic stenoses, where the finest of the Schrotter catheters is unable to pass. In the dilatation treatment of laryngeal stenoses, due to scar tissue, I have never seen any improvement with fibrolysin. It may be mentioned here that, in peroral intuba-

not by the O'Dwyer and the Kulant method, "halitautoscopy" may occasionally be employed to advantage."

The writer has quoted Brunnings at length to show the difference between his methods and those advocated in this monograph; he has never used the counter-pressure apparatus and must therefore discuss it from Brunnings' standpoint. It will be noted that he praises it particularly for operations in the anterior part of the larynx. With the methods of the writer, described above, it is never necessary to use an instrument to force the larynx backwards for the anterior commissure is always seen through the small instrument. The writer can conscientiously claim that with his methods, he has never failed to get a good view of the entire larynx at the first sitting except as stated above in one patient with chorea. He has repeatedly removed tumors in the anterior commissure which he believes would have been inaccessible by other methods. After such experiences, the writer feels that a complicated "counter-pressure" apparatus is not essential to successful work. His argument that two hands are, as a rule, required to bring the larynx into view is not borne out by the writer's experience. Formerly when large tubes were introduced between the incisor teeth, it was the rule to see only part of the larynx and successful operating was out of the question; with the small tube and the straight position of the head, this objection no longer holds true. The writer has repeatedly demonstrated that practically no force is exerted on the tube to see the anterior commissure and often the weight of the instrument almost seems to do this. All patients are easily examined with the writer's methods and operations are performed with ease. These criticisms are not directed at Brunnings' particularly; the same objections apply to any method of direct laryngoscopy in which the tube is introduced between the incisor teeth. It will be noticed that his method of treating laryngeal stenosis differs materially from that suggested by the writer. It would seem that there could be no argument advanced in favor of intermittent dilatation when the continuous dilatation is so easily obtained with the endotracheal tube which in the hands of the writer has been so successful. In children or in adults intermittent dilatation would seem far inferior to the use of tube dilatation. The frequent treatment might be expected to produce various mechanical lesions. In the writer's method the tube is retained every two weeks or more; after treatment it is probable that dilatation is not required often at all, and the more painful than necessary

operation is avoided. In the position of the head in the straight position for the supine and sitting position, the writer has seen what the writer has tried to explain in this chapter, that the head is not tilted backwards. In his position the head is tilted forward. The muscles at the back of the neck are relaxed and the larynx strained through the examination. When the patient is in this position with the natural position of the head in the straight position, the superior view of the larynx is easily apparent. It is evident that the technique of that Brunnings uses for ordinary work are the large like the majority of the instruments in use at the present time, so an expensive apparatus need not be attached to force the larynx back so that the anterior part can be seen. The straight position of the head and the use of the 10 millimetre tube makes



all this is necessary to see the larynx even in the most difficult cases. And while it is probable that the patient is perfectly comfortable during the use of the latest foreign method of dilatation, the methods are very tedious and time consuming. It will be seen that the position of the head does not vary much from the position in the writer's method, and that the patient is comfortable throughout the entire procedure. The writer is not making the head tilted backwards, but is holding it in a position which is natural and comfortable. It is a common mistake to think that the head is tilted back in the writer's method, and that the patient is uncomfortable. The writer's method is simple and easy to perform, and the patient is comfortable throughout the entire procedure. The writer's method is the only one that has been found to be successful in the treatment of laryngeal stenosis. It is a simple and easy method, and the patient is comfortable throughout the entire procedure. The writer's method is the only one that has been found to be successful in the treatment of laryngeal stenosis.

Examination with the mirror showed a tumor on the left vocal cord just at the anterior commissure—a position which is admittedly most difficult to operate upon. The larynx was deadened with 20% alypin solution and the small tube passed without difficulty. There was no trouble exposing the anterior commissure and in a few minutes the papilloma was shaved off with straight forceps passed down at right angles to the cord. The writer is sure that with any other tube the tumor could not have been as quickly and as easily removed. The patient had a short, thick neck and did not tolerate the tube well. It would have been impossible to use the Jackson large or small separable speculum. The writer does not report cases to exploit any special skill on his part but to emphasize the ease with which the small tube can be used. He knows, after having tried all sorts of instruments, that his modified tube has solved all the problems connected with direct laryngoscopy. With it most laryngologists see the entire larynx at the first attempt and a week's practice is all that is needed to perfect one in the use of the instrument. When the tube was exhibited at the meeting of the American Academy of Ophthalmology and Oto-Laryngology in August, 1912, and its advantages pointed out, there were some who thought it was too small; but if the writer succeeds in convincing a few laryngologists that one does not require a large tube for laryngeal work and that the disadvantages of the large tube far outweigh the advantages of the small one, he will feel fully repaid for the time spent in writing this little book. After all the only argument that can be advanced against a small tube is that one may not have sufficient room to see and to operate through at the same time. The answer is that one soon learns to operate as easily through the small as through the large tube. For diagnostic purposes there can be no argument against the smaller instrument because it is a self evident fact that it is more easily introduced. The writer's articles on the subject have been appearing for the past four years but only recently have laryngologists shown any desire to take up the straight method. That, once mastered, it will be used to exclusion of all other methods, the writer is certain because it is the easiest and most practical of all methods. This statement is made after a personal experience with all other methods and it can be substantiated by actual clinical work. In the operative cases cited above, it will be seen that the operative work embraces all parts of the larynx; that it is as easy to remove tumors from the anterior commissure

and vocal cords as from the posterior commissure. No other instrument with which the writer is acquainted will allow this in every case. Success is largely due to the straight position of the head which the patient can tolerate indefinitely. In doing his work, the writer does not prefer any special table. Any operating table, high or low, will do and in different hospitals all kinds of tables have been used successfully. The writer has laid great stress on direct laryngoscopy because one must have a thorough knowledge of it if he would do bronchoscopy and esophagoscopy and because he deems it of the utmost necessity to emphasize the importance of learning the straight or easy as opposed to the extended or difficult methods. As this book is intended principally for beginners and has for its purpose the simplification of work which is generally considered difficult, these remarks are pertinent. In the next chapter on tracheo-bronchoscopy, the straight method will often be referred to for the writer uses it as the beginning of the passage of the bronchoscope in every case. The straight position of the head is insisted upon even in the examination of the upper end of the esophagus as being the cardinal principle of all tube work.

(To be continued.)

MILITARY SURGERY.

BY GUSTAVUS M. BLECH,
CHICAGO.

(Continued from March issue.)

The majority of military surgeons are agreed that at the front the principal therapeutic measures to be instituted are:

- (1) Absolute rest.
- (2) Complete abstinence from food and drink for at least forty-eight hours; and
- (3) Protection against infection.

In order to appreciate the difficulties which beset medical officers in the field, it is necessary to discuss the above-mentioned measures somewhat in detail.

Absolute rest.—A soldier shot in the abdomen by a jacketed bullet and left on the battlefield in a helpless condition without any attention for several hours has in all probability a better chance for recovery than the wounded who is at once picked up and carried some distance for surgical aid, provided, of course, no vessel of importance has been injured producing a serious internal hemorrhage.

The importance of rest for patients with abdominal wounds has caused several writers to advocate in all earnestness to leave them on the field and to detail hospital corps men to provide shelter and at-

tention for a time until it is felt that transportation is safe. If it be realized that the services of the sanitary personnel are strained to the utmost after an important engagement and that tactical situations may preclude the presence of non-combatants on the firing line, no proof is needed to show the impracticability of such a proposition.

Transport cannot be avoided, especially in winter time, but it must be reduced, as far as its harmful aspects are concerned, to the greatest possible extent.

The writer has taught the litter-bearers of his command to caution their patients to completely relax and remain passive while being lifted on the litters, to carry the loaded litters as gently as possible to the nearest station, and to undertake even that only after the administration of a liberal dose of morphin hypodermatically. In the event the drug cannot for some reason be injected under the skin it should be administered by mouth, even though this apparently violates the law not to administer a drop of water.

Morphin in gunshot wounds of the abdomen is what a splint is to a fractured extremity, and I am convinced that without it many wounded soldiers that have reached the field hospitals or dressing stations and made eventual recoveries would have died on the transport or soon after reaching its destination.

Complete abstinence from food and drink.—This must be followed explicitly. Most patients suffering from perforated gunshot wounds of the abdomen suffer intensely from thirst and beg pitifully for a swallow of water from the tempting canteen. I can find no better way of warning them to repeat the instructions I have given my men: "Any one of you who will yield to such pleadings is gambling with human life, and will be held before a court-martial on a charge of murder."

Civilian surgeons will be apt to ridicule such drastic teachings to sanitary soldiers, who, it must not be forgotten, are laymen. How often have patients after laparotomy taken liberal quantities of water when not observed by the nurse and lived to laugh at our "benighted" teachings! It happened to me on two occasions and a disaster actually resulted. In one instance the patient was dead one after the diarrhea and had no further trouble whatever. In both cases the severe watery diarrhea resulted in an acutely inflamed peritonitis.

But there is a very different case to be considered, a wound by a missile of small caliber, which may produce a simple perforation of the intestine, but which may also produce a compound

stomach or jejunum, or forgotten and I will therefore refrain except to narrate one instance during the above campaign in France which happily illustrates my point.

An English soldier, officer and a line officer were shot through the abdomen on a French front or so later found side by side by a field officer. The line officer begged for a drink and the canteen was placed against his lips. The same was handed the wounded surgeon, but though he suffered as much as his comrade, he remembered his teachings and energetically waved his would-be Samaritan aside. The doctor recovered, the line officer died, though both had similar injuries and were placed in the field hospital at the same time.

Prevention of a fatal infection.—The small wounds of entrance and exit produced by jacketed bullets require a simple dressing such as is afforded by the sterile first aid packet. Whether the wound margins should be painted with iodine, as is advocated by some writers, or let alone, is, in my opinion, of no moment.

Of greater importance is a recent contribution in the *Military Surgeon* by Col. Jacob Frank, Surgeon-General of Illinois, the well known Chicago surgeon, who maintains that the treatment of covering the abdominal wounds with aseptic dressings is all wrong. Indeed, his idea is revolutionary in character.

Frank correctly maintains that when a man has been hit by a missile of small caliber it is not always possible to tell whether viscera have been perforated or not, in the absence of symptoms unmistakably pointing to perforation. He demands that all abdominal gunshot wounds should be looked upon as perforating ones, as far at least as treatment is concerned, in order to run no risks of a false diagnosis. By applying a sterile dressing we protect the wound channel against infection from without, but at the same time we occlude the wound and allow the peritoneum to be overwhelmed by infection from within. He believes that the appearance of intestinal flora on the free peritoneal cavity by this method of treatment of intestinal wounds will result in a permanent and severe peritonitis, and that the only way to prevent this is to leave the wound open, to allow the peritoneum to be washed out with sterile saline solution, and to pack the wound with sterile gauze. He believes that the only way to prevent this is to leave the wound open, to allow the peritoneum to be washed out with sterile saline solution, and to pack the wound with sterile gauze.

It is not necessary to discuss the merits of this method of treatment, but it is worth noting that it is a radical departure from the accepted practice of the military surgeon. It is a method which, if it is to be of any value, must be followed with the utmost care and precision.

after receipt of injury the wound of entrance (exit, if the man is shot through the back, G.M.B.) is to be drained by the insertion of a piece of gauze wicking. If the wound is too small for the insertion, it should be enlarged with a sharp knife or dilated with artery forceps. The wick should be pushed into the abdominal cavity with some suitable blunt instrument. Frank recommends that one end of the first aid bandage be used as a wick (rolled as such between the fingers) and the rest used as an ordinary dressing or bandage which will prevent the wick from becoming lost in the abdominal cavity. He has so much faith in the efficacy of early drainage that in the absence of a regulation first aid packet he would not hesitate to use any ordinary piece of clean linen, such as a strip torn from a shirt.

Frank makes only one demand and that is that this treatment must be administered very early, not later than two hours after the occurrence of the injury. For this reason he advocates that all combatants should be given proper instruction, so that self help or help by a combatant comrade may be on hand on the firing line proper, if that cannot be reached by the sanitary personnel during the battle, a thing out of question under modern conditions of warfare.

It goes without saying that when sanitary personnel do reach the injured they should resort to the same method.

Frank believes that infection will be prevented or minimized by allowing the escape of all infectious matter, no matter of what character, and that in all perforations of the hollow viscera the transport will be robbed of its horrors, as the gases have an opportunity to escape, I presume, somewhat in the manner of an artificial fistula in excessive tympany, and distention of the bowels and stomach will be lessened thereby.

If I am permitted to comment somewhat on this teaching, I may say that theoretically at least the idea is sound. If it can be demonstrated by animal experiments—and this the writer will do in the near future—that the problem will work out in practice as well, then Colonel Frank will have rendered the science of military surgery a great service.

On first blush, it would seem that Frank is violating the law of "non nocere," as the rolling of the sterile gauze into a wick by dirty fingers—and in the field the fingers of all who cannot disinfect them will be dirty—but there is of course a great difference between dirt in the ordinary sense and infectious material, and Frank maintains that the endogenous infection by, let us say, the colon bacillus is so much more dangerous, that contact infection

loses its significance, especially in view of the fact that the wound is left open for the purpose of drainage.

Of course even that danger could be eliminated to a great extent and even the very remote danger from tetanus, if the government would add a long piece of wicking and an applicator to the first aid outfit.

The principle of drainage is favored by practically all authorities when the external wounds are large.

The following general rules can be accepted as axiomatic for frontal aid stations:

(1) If the abdominal wound is large and the viscera do not protrude, gauze drainage is imperative. At the regimental aid stations it is best to tamponade such wounds preparatory to transport. Sutures of fascia, muscles, and skin can be undertaken at the dressing stations, where the facilities for emergency surgery are better.

(2) Prolapsed bowels, if not otherwise injured, should be cleansed with great gentleness by a piece of sterile gauze and returned to the abdominal cavity. It is imperative that all forcible manipulations of the prolapsed intestine be avoided. A simple and effective way to cause reduction is to separate and lift up the wound margins and to allow the bowels to fall back by gravitation. Occasionally the improvised Trendelenburg posture will be found helpful.

(3) In the event the prolapsed bowel is found to be injured, intestinal suture should not be undertaken at the front. It is best to secure the exposed bowel loops by means of a piece of gauze strip, so that they cannot escape back into the abdomen, and apply voluminous dressings, to protect against injury. Such patients should be sent to the rear with a special message indicating the nature of the injury where suture or resection can be performed in *lege artis*.

(To be continued.)

SURGICAL TRAUMA AND INFECTION.

The question frequently arises in the minds of operators why in two clean operations done for the same thing under similar circumstances one becomes badly infected and the other heals *per primam*? It is chance; the number and virulence of bacteria entering the wounds may be the same; the amount of damage done by the operations may be the same, the total resistance of the two patients may be the same, and still one may suppurate and the other heal. If a devitalization is done at point A and if the few bacteria admitted are lodged at point B, which is healthy, no infection occurs. But if they lodge at point A, the two factors necessary for infection meet, and infection cannot fail to follow.—W. A. BRYAN, in *The Southern Practitioner*.

NOTES ON A CASE OF ACUTE POST-OPERATIVE DILATATION OF THE STOMACH.

GOODRICH B. RHODES, A.B., M.D.,

Junior Surgeon to Cincinnati City Hospital, and Episcopal Hospital for Children
CINCINNATI, O.

It is a fairly accurate observation that the less sharply defined our knowledge of the pathology or etiology of a lesion, so much greater is the mass of literature on the subject. Until a problem in pathogenesis is solved, however, each new fact or observation has a definite value, and should be reported. Therefore, the following case is related. Certain features are of interest, and the accompanying radiograph is, to the best of my knowledge, the first to be presented in reports of post-operative dilatation or atony of the stomach.

CASE:—A well built, well-nourished white man, aged 18 years, was brought to the City Hospital, May 4, 1912, on the service of Dr. S. P. Kramer, with a stab-wound of the left side. He had had a fight, in the course of which he was stabbed from above downward with a "Barlow" pocket-knife. He had been drinking, but was not intoxicated.

His head, neck, and extremities were found normal, his heart sounds clear and strong. The right side of his chest was also normal. The abdomen was distinctly rigid over the upper and left quadrant, but only slightly sensitive.

On the left side of the chest, in the tenth intercostal space and anterior axillary line was a small stab-wound, which undoubtedly penetrated the abdomen, for a small piece of omentum was seen protruding through the wound.

Expansion of the left chest was limited, but normal resonance seemed to be present and the breath-sounds were present over the whole lung, but not as clear and strong as on the right side. Temperature, 97.4°; pulse, 96; respiration, 24.

I saw the patient about one hour after his admission to the hospital, and because his wound evidently penetrated the abdomen, and because he had increasing abdominal rigidity and pain, I operated immediately:

Either anesthesia, by drop method. Incision through left rectus sheath, in epigastric region, about four and one-half inches in length. The abdomen was thoroughly explored in the neighborhood of the upper left quadrant. The intestine were found distended, but no hemorrhage or visceral lesions were discovered. The omentum was replaced in its normal position, after removing the

infected portions, which protruded through the stab-wound. A drain was placed in the stab-wound and the laparotomy incision was closed. There was no rough manipulation of the viscera, no greater pulling or dragging upon mesenteric attachments than is usual in other intra abdominal work. The patient returned to the ward in very good condition; he was given a hypodermatic injection of morphine, grain 1/4, and he had a comfortable night. The morning after the operation he had a temperature of 98.8°, pulse 72, and respiration 20.

He continued in good condition until two days after operation, when he became restless and vomited four ounces of dark green material, thought by the nurse to be fragments of pickles. He was very noisy and begged for water, which was given him *ad libitum*. He complained of pain in his left



side and his temperature rose to 100°, pulse 104, respirations 30. Drain removed. His restlessness and thirst became very severe, and the vomiting occurred again, six ounces of the same greenish material. The urine gave but a normal reaction, and he slept through the night. The third morning the vomiting and restlessness continued, and the vomitus assumed a fecal character, with a very foul odor. Urinalysis showed normal urine and he was voiding comfortably. I found his abdomen greatly distended but fairly soft and with no waves to be detected, and tympany over the

whole extent, with no abnormal peristalsis; pulse 116, respirations 30. I ordered a turpentine enema given immediately, and the patient expelled a large amount of flatus, but no stool.

Fearing post-operative paralytic ileus, or acute dilatation of stomach, eserine salicylate and strychnine sulphate were ordered, together with gastric lavage. The orders in regard to the eserine and strychnine were assiduously carried out, but the lavage was entirely neglected.

The lad's appearance was not that of a desperately sick patient, but his vomiting, which now became very frequent, and the advent of severe hiccough, coupled with the abdominal distension which enemata and rectal tubes failed to relieve, provided a gloomy prognostic picture. At no time from now on did his temperature rise above 99.6° , running very frequently subnormal, as low as 97° ; but his pulse rate continued elevated, between 90 and 120, usually over 100, until late in the course of his illness.

On the fifth day after his operation he was given bismuth subcarbonate, 2 ounces, in a bottle of bovilac, and his abdomen was x-rayed twelve hours later, by Dr. Sidney Lange, to whom I am indebted for the plate here reproduced.

The radiograph shows the condition very clearly. There had been absolutely no attempt on the part of the stomach to empty itself, and none of the bismuth has passed even beyond the cardiac half of the stomach. It lies in the concavity formed by the vertebrae and ribs of the left side, and the atonic gastric musculature has not had force enough to lift it over the vertebral column. There is gas in the intestines, but the sacculi of the large intestine are fairly sharply defined, and as the boy was passing flatus, it is fair to assume that the paresis did not involve the large intestine. On the sixth day the patient had a stool and from then on rapidly progressed to recovery.

In reviewing this case certain features stand out in contrast to the reported cases, chief among which are the discrepancy between the patient's appearance and the gravity of his symptoms, and the fact that the urinary secretion was undiminished.

The pathogenesis of this case would seem to fall under the neuropathic theory of gastric dilatation, inasmuch as we have here a diaphragmatic lesion in all probability involving either directly, or in its reparative process, some fibers of the solar plexus. That this lesion must have been of considerable bacterial or mechanical irritability is evidenced by the rapid effort on the part of the omentum to wall it off, for even in the short time between the patient's

injury and his admission to the hospital the omentum had worked itself into the wound. The occurrence of hiccough could be explained as phrenic nerve irritation, but the continued abdominal distension might also produce it in the absence of any such direct irritation.

Although this patient recovered with no treatment except eserine and strychnine and enemata, gastric lavage should never be omitted.

Indeed, if gastric lavage were used as a routine following all abdominal operations, performed either on the patient's return to the ward or, better still, while on the table, we would not only lessen the post-operative vomiting and discomfort, but in a large measure would also prevent the occurrence of post-operative dilatation of the stomach.

4 WEST SEVENTH ST.

A SIMPLE REDUCTION OF SHOULDER DISLOCATIONS.

My mode of procedure is the acme of simplicity, and is as follows: Having divested my patient of all clothing necessary—it is not always requisite to remove the vest and shirt—I place him on the ground in a sitting position and grasp the wrist of the injured side, the third party doing the same with the sound one. We then raise both arms straight above the head, taking care to keep them parallel, and extending them upwards till the patient is just raised from the ground, at which point a click is heard and felt and the dislocation is reduced without further manipulation, except that occasionally in cases of subscapular dislocation it may be necessary to slightly rotate the arm from right to left in the case of left, and from left to right in that of the right arm. These movements are, of course, carried out during extension.—JULIUS CAESAR in *The Lancet*.

PAINFUL HEEL.

Painful heel is frequently due to an exostosis, a spur, on the bottom of the calcaneum. In cases of long standing rebellious pain under the heel, it is wise to radiograph in order to see whether this lesion is present. While we sometimes find this condition in patients complaining of no pain under the heel, it has been pretty well demonstrated that removal of these spurs when present in "painful heel," is followed by abatement of symptoms. Before, however, such spurs are removed, the attempt should be made to take pressure off from them by means of well-fitting arches, felt rings, or other devices designed to take weight off from the painful heel.—E. S. GEIST, in *The Saint Paul Medical Journal*.

INSTRUMENTS FOR MEASURING JOINT MOVEMENTS AND DEFORMITIES IN TRAUMATIC TREATMENT

H. C. GARDNER, M.D.,

St. Louis, Mo.

The instruments described below were devised by the author in response to his own needs in practice work.

While they have only an interest in relative value, they serve as a guide to the results of treatment; they are a source of interest to the patient in the progress of his case, and they constitute at least a step in the solution of the treatment of fractures from the mechanical point of view. It has always been to the writer's regret that it has been so difficult to become

No figures are given of average joint movements in a series of individuals because the instruments apply only to the extremes, of which there is usually a sound side that furnishes a better pattern of the normal motion of the injured member than does

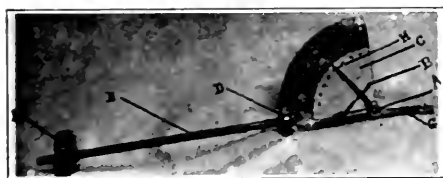


Fig. 1.

that of the corresponding member of other individuals.

1. INSTRUMENT FOR MEASURING THE FLEXION MOVEMENT OF THE ANKLE

A hinge (A) setting into a graduated arc of the external malleolus and the os calcis is attached to a band (B) lying along the outer surface of the heel. Attached laterally, at right angles to the band and centered to the hinge, is the band (C) of a dial (D). At the opposite end of the band (C) is a rod (E) into which is set a rod (F) long enough to reach the ball of the foot. The proximal end of the rod is adjusted by a screw (G) so that the rod (F) lies against the os calcis, parallel to the line of the lower border of the large tarsal bone, and the dial, which bears the graduated arc, is perpendicular to the axis of motion. The portion of the foot to be measured by the plate (D) is held in position by the thumb screw (H) and the rod (F) is moved along the walls of the degree arc to indicate the amount of flexion and added to the

flexion movement of the instrument are: 1, a part for indicating the angle of the leg; 2, a part for the line of the foot; 3, a part for recording the movement between the foot and the leg.

The remainder part of the instrument are: 1, a part for indicating the angle of the leg; 2, a part for the line of the foot; 3, a part for recording the movement between the foot and the leg.

The line of the leg is best shown along the posterio-internal border of the tibia, between the internal malleolus, the line of the foot between the ball of the heel and the ball of the great toe.

An appropriately shaped clasp (A) resting against the postero-internal border of the tibia at a given distance from the tuberosity, is adjusted to a longitudinal rod (B) lying along the groove between the internal malleolus and heel, snugly against the former. The second part consists of a

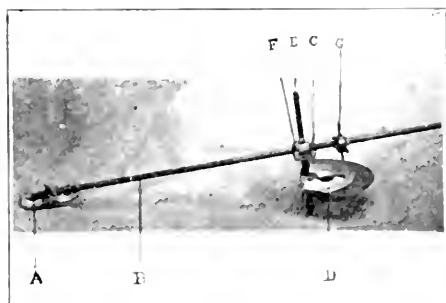


Fig. 2.

band (C) beneath the heel and toe, at right angles to this band is moved a quadrant (D) centered to a screw (E) held perpendicular to (C) by a double socket (F). The third part consists of a quadrant (G) held parallel to the rod (E) by a socket (H) at (I). As the second part reaches around the rod (E) the degrees of movement are indicated on the quadrant by a pointer.

The instrument is held in position by the thumb screw (J) and the rod (F) is moved along the walls of the degree arc to indicate the amount of flexion and added to the

flexion movement of the instrument are: 1, a part for indicating the angle of the leg; 2, a part for the line of the foot; 3, a part for recording the movement between the foot and the leg.

The remainder part of the instrument are: 1, a part for indicating the angle of the leg; 2, a part for the line of the foot; 3, a part for recording the movement between the foot and the leg.

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Third: Estimate the perpendicular distance between the base-rod (B) and scaphoid on the sound side while the foot is in a degree of flexion equal to that on the injured side.

Fourth: Estimate the same perpendicular distance on the injured side and compare the two.

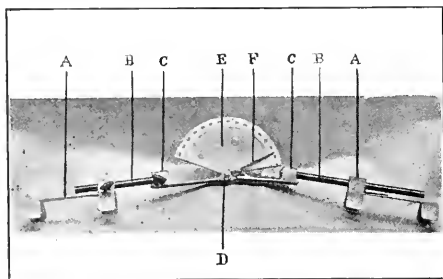


Fig. 3.

III. INSTRUMENT FOR MEASURING THE ANGULATION OF THE KNEE, ELBOW, AND WRIST, ALSO THE CARRYING ANGLE OF THE ELBOW (FIG. 3).

Two clasps (A), each consisting of two semi-circular bands connected by a bridge, are attached one to each end of a rod (B), which is set into a

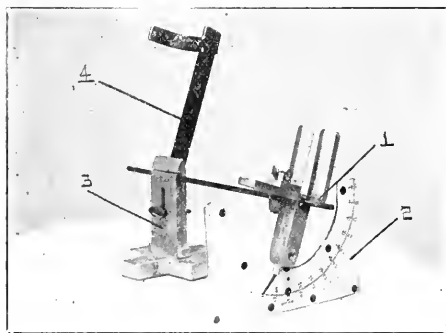


Fig. 4.

socket on the end of each leaf of a hinge (D), to one part of which is centered a quadrant (E), to the other a pointer (F).

One clasp is set astride, say, the forearm, the other astride the arm; and as the elbow is bent the degree of movement is read from the quadrant.

For measuring the carrying angle, the instrument is best placed with its hinge on the inner surface of the internal epicondyle, the clasps on the corresponding sides of the arm and forearm.

IV. INSTRUMENT FOR MEASURING THE CIRCULAR MOVEMENTS OF THE RADIUS (FIG. 4).

The instrument consists of a clamp (1) adjustable to the expansion of the lower end of the radius, to which clamp is fixed a pointer playing around a quadrant (2) attached to the clamp by a ferrule through which slides a rod that at the elbow passes through a standard (3) surmounted by a gable ridge on which rests the groove between olecranon process and internal condyle. To this standard is fastened a reach (4) that clasps the arm higher up, holding it in fixed position both laterally and from before backward.

As the radius moves around the ulna, carrying the clamp and pointer with it, the amount of movement is read off on the quadrant.

STRANGULATED HERNIA.

Most cases of strangulated hernia give positive evidence of intestinal obstruction, besides the local sign of an unreducible hernia, but strangulation may exist without marked signs of obstruction, as for instance, we may have a large mass of omentum incarcerated, with shock, vomiting and the local signs present, and yet the bowels continue to move, until a peritonitis produces the obstruction and death.—F. FLAHERTY, in *N. Y. State Journal of Medicine*.

THE MASTOID IN OTITIS MEDIA.

It is the consensus of opinion to-day that all cases of acute middle ear suppuration are complicated by an inflammation of the mastoid cells. In favorable cases the mucous membrane alone is involved and absorption of the pus from the mastoid cavity slowly takes place before or after the middle ear has healed; at other times an osteitis of the mastoid develops, and healing, if it does take place, occurs very slowly. It may be questionable if a true osteitis of the mastoid cells ever heals completely without operative intervention.—WM. MITHOEFEER, in the *Lancet-Clinic*.

TETANUS ANTITOXIN IN OPEN FRACTURES.

The subject of the treatment of open fractures cannot be dismissed without a reference to the administration of tetanus antitoxin. Although no surgeon who considers himself worthy of the name would think of omitting the administration of tetanus antitoxin, yet its use is by no means as general as it should be. The all too frequent occurrence of tetanus, following the open fractures, as seen in some of our general hospitals, is proof of the fact. More general use of tetanus antitoxin is to be urged upon all physicians.—J. L. BENDELL, in *Albany Medical Annals*.

NOV. DESCENT OF THE SUBMARGINAL RIB OF IN A CASE OF ANOMALY APPENDICULUS

R. J. H. F. WILKIN, M.D.,
Brooklyn, N. Y.

R. R., station agent in employ of Long Island
Railroad was seen in consultation with Dr. N. S.

WILKIN, M.D., 100 West 11th Street, New York City, N. Y. The patient was a white male, 25 years of age, 5 ft. 10 in. tall, 160 lb. weight, with a normal build. He was seen in consultation with Dr. N. S. Wilkin, M.D., 100 West 11th Street, New York City, N. Y. The patient was a white male, 25 years of age, 5 ft. 10 in. tall, 160 lb. weight, with a normal build. He was seen in consultation with Dr. N. S. Wilkin, M.D., 100 West 11th Street, New York City, N. Y.



FIG. 1. (a) Normal type. (b) Persistence of the normal type. (c) Persistence of the normal type.



FIG. 2. Persistence of the normal type.

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WALTER M. BRICKNER, M.D., Editor

NEW YORK, JUNE, 1914.

OUR "PRINCIPLES OF MEDICAL ETHICS."

We believe in the practice of the highest ideals of medical ethics, and we would not wish to relax a jot in the strictest application of any detail of the principles of those ethics that is based on common sense or reflects the proper professional spirit. But, believing also that our code of medical ethics lost much of its great dignity when it was transmuted from the unwritten expression of the professional conscience to a printed primer of precise "principles," we must protest against one of these "principles" that is absurd, archaic and inconsistent.

We would again call attention to Chapter II., Article I., Section 5 of the revised Principles of Medical Ethics of the American Medical Association, published two years ago:

It is unprofessional to receive remuneration from patients for surgical instruments or medicines; . . .

This rule would mark as unprofessional, by our standard, the great Paul Ehrlich, who has received a royalty on every ampoule of salvarsan and neosalvarsan. Why is it "unprofessional" to receive a remuneration from patents on surgical instruments? Why is it not equally "unprofessional" to receive royalties from medical books, equally sold to professional brethren? Why is it not equally "unprofessional" to receive fees for instructing undergraduate and post-graduate stu-

dents? The Hippocratic oath proscribes the taking of such fees, and the professor who administers that oath at graduation exercises draws his salary from the students' pocketbooks! The proscription against royalties on instrument patents is as outworn in principle as the Hippocratic proscription against fees for tuition.

Our printed ethics, be it noted, does not gain-say the patenting of instruments, but merely the profiting by such patents. Yet the only basis, in tradition, for this rule lies in the possibility of patenting for the purpose of retaining exclusive use—of which mischievous practice we have the illustrious recent instance of the secret employment of the obstetric forceps by the Chamberlains, a trifle over two hundred years ago. Any physician who would want to patent an instrument to secure its use to himself alone would not be the sort of man who would bother himself much about "principles" or "ethics"; nor, probably, would his device be of such a character that its monopoly would seriously concern the profession.

Now that the American Medical Association is about to meet again, we hope the House of Delegates will omit this sentence from Section 5 or, if something about patents must be said, amend it to read:

It is unprofessional to patent surgical instruments or medicines for the purpose of preventing their manufacture and sale.

Although this is the only "principle of medical ethics" which ought to be omitted because it is wrong, there are several others that ought to be omitted or altered because they are silly.

Chapter II., Article II., Section 3, says:

When a physician or a member of his dependent family is seriously ill, he or his family should select a physician from among his neighboring colleagues to take charge of the case.

Probably the sick physician has many patients in more or less distant communities. Why less than they may he not feel privileged to select his medical attendant outside of his neighborhood? If he does not want any of his "neighboring colleagues," why "should" he (and of course he won't) "select a physician from among" them? However, he may console himself, if he does not break this rule, with the surprising information that

Other physicians may be associated in the care of the patient as consultants.

This is gratifying, but not enough. It should also be stated that the sick physician may employ a trained nurse if he can afford it.

initiation fees and an annual income therefrom and from dues of \$30,000.

We do not question that these large sums which, as the years go by, will increase to vast proportions, are to be put to good purposes; but we believe it would be quite fitting that, at the coming convocation, the fellows should be told just what those purposes are.—W. M. B.

THE WM. T. BULL MEMORIAL.

Now that we are in an inquiring mood, we should like to ask also what has been done with the Wm. T. Bull Memorial fund? This fund was collected five years ago among the lay and professional admirers of the then recently deceased surgeon to provide a Bull Memorial Department of Surgical Research in Columbia University. No accounting of the fund has been made to the contributors nor, so far as we know, has the department been established.—W. M. B.

MEETING OF THE AMERICAN MEDICAL EDITORS' ASSOCIATION.

On June 22, at 9 A. M., the above-mentioned association will meet at the Marlborough-Blenheim Hotel, Atlantic City, N. J., under the presidency of Dr. E. A. Van der Veer of Albany, N. Y. An unusually attractive programme is being prepared. Among the papers are the following:

1. President's Address, E. A. Van der Veer, M.D., Albany, N. Y.
2. "Relation of the Medical Press to the Cancer Problem," by Mr. Fred'k L. Hoffman, Statistician of the Prudential Ins. Co., Newark, N. J. (by invitation).
3. "The Things That Count in Medical Practice," by H. Edwin Lewis, M.D., New York.
4. "Ideal National Medical Journal: What It Should Be and What It Should Not Be," by W. J. Robinson, M.D., New York.
5. "Two Problems of the Organization Journal: The Mediocre Paper and the Editorial Department," by Sarah M. Hobson, M.D., Chicago, Ill.
6. "Medical Journalism as a Local and as a National Proposition," by Thomas S. Blair, M.D., Harrisburg, Pa.
7. "Medical Books and Journals," by T. D. Crothers, M.D., Hartford, Conn.
8. "The Medical Periodical and the Scientific Society," by F. H. Garrison, M.D., Washington, D. C.
9. "Editorial Experiences," by A. L. Benedict, M.D., Buffalo, N. Y.
10. "The Special Medical Journal," by A. Bassler, M.D., New York.
11. "The Medical Profession and Its Influence from

a Buying Standpoint," by Joseph MacDonald, Jr., M.D., New York.

12. "The Preparation of the Original Article and the Editors' Latitude," by E. Franklin Smith, M.D., New York.
13. "Medical Publicity in the Lay Press," by Chas. E. Woodruff, M.D., New York, Lieut. Col., retired, U.S.A.
14. "He, Who Is Without Sin Among You, Let Him First Cast a Stone," by E. Reissman, M.D., Newark, N. J.

Surgical Suggestions

The abduction treatment, so useful in many types of "stiff and painful shoulder," is not conveniently carried out in an abduction splint, as recommended. The wearing of such an apparatus, not regulable from hour to hour, would necessarily confine the patient to his home. It is much better, therefore, to put him to bed or, in mild cases, on a lounge, and abduct the arm on pillows, with or without a sling running from the wrist to the head of the bed, elevation of which, by causing the body to slide down unconsciously, increases the abduction. This method of abduction is not only convenient, comfortable and easy of application, but also has the advantages of being easily regulated and, if necessary, discontinued occasionally to relieve pain or fatigue.

The ideal method of cholecystectomy is to: drag the gall-bladder and, with it, part of the liver as far as possible out of the wound, with a clamp; split the serosa through the middle of the under surface of the gall-bladder down to or on the cysticus; peel back these peritoneal flaps; ligate the exposed cystic bloodvessels on the cysticus, thus obviating bleeding; clamp off and amputate the gall-bladder; investigate and treat the hepatic and common ducts; suture the peritoneal flaps over the gall-bladder bed; insert tube drain down to or into the cysticus, according as it does or does not appear desirable to ligate the duct. This procedure makes the operation practically bloodless and easily controllable, obviates oozing from a raw liver surface and the introduction of gauze packing to control it, and shortens the period of healing. To be sure, this ideal method is not always applicable, as in gangrenous gall-bladders, especially in obese subjects.

scarlet fever, tuberculosis, or other diseases dangerous to the public health, or to make arrangements with neighboring communities for establishing such hospitals."

In the majority of the states, power to establish and maintain hospitals for communicable diseases is permissive to counties, townships, and cities with great variation, dependent upon the point of view of the legislators in the various states and upon the degree of congestion existent in various portions of the state.

In Alabama, a portion of the state health appropriation must be employed for the maintenance of a field hospital for communicable diseases.

In Arizona, North Dakota, Ohio, Oregon, and South Dakota, local boards of health are authorized to provide temporary places for the care of persons with communicable diseases. In Oregon, the regulations of the State Board of Health advise municipalities with a thousand inhabitants to securing cottages to properly segregate persons afflicted with contagious diseases.

The general attitude towards hospitals has been rather the individual benefits which accrue to the patients. The large social significance of hospitals as institutions for the protection of the community is slowly being disseminated throughout the country. At the present time, there is a large diversity of institutions maintained for specific purposes at an immense cost. It would be possible to unite many of these institutions in such a way as to eliminate the duplication of effort without increasing the overhead charges. There is an unfortunate tendency to the duplication of institutions of the same order which tend to impoverish a community rather than enrich it or secure greater efficiency in administration.

Under modern sanitary régime, it would be rational to combine many existing institutions to the advantage of both the patients and the community.

Greater efforts should be given to the establishment of large general hospitals with general outpatient departments capable of giving such medical, surgical, and social care as would relieve the beds of the hospital for the acute cases where hospital care is imperative.

There is an inadequacy of hospital care for the communicable diseases, particularly for whooping cough, measles, scarlet fever, and erysipelas. While there might be some objections to having wards of a general hospital given over to the care of these conditions, there does not seem to be sufficient grounds for divorcing such diseases from the plan and scope of a well-organized modern sanitary hospital. The complications which attend these conditions frequently require surgical intervention and the facilities for such operative care have been overlooked almost entirely in the planning of institutions for the care of these diseases.

HOSPITAL RESEARCHES.

In the advances of all sciences, wave follows wave and there are periods of crest and depth which serve to indicate the measurable progress. Inspiration and aspiration call forth ambition, edu-

cation, and research. In the domain of medicine, a new era has arisen. The standards of the past, rooted in antiquity and tradition, are being revised in the light of modern needs. The desire for facts, scientific and basic, has given rise to a period of marked development. Under the goad of educational ideals, a reorganization is slowly making itself manifest. The dependence of good medicine upon educational advances is more evident than ever before and its recognition is leading to an intelligent conception of the new fields of medical thought.

The discoveries of Koch and Pasteur developed bacteriology. The investigations of Wright, Ehrlich and Wassermann have revised our theories of immunity. The studies of Funk, Chamberlain and Vedder have given us new theories of food values. The careful work of Carrel, Roentgen, Curie, Lane, Murphy, Crile, Welch, Meltzer, Starling, Loeb, Trudeau, and numerous other students with vision have yielded to the community worthy dividends beyond compare.

Research is fundamental to progress, and research is based upon thoughtful analysis and medical imagination. The hospitals will have a unique place in the medicine of the future. The spirit of the laboratory in its highest sense must permeate our wards and the clinical atmosphere of the wards must unite with that of the laboratory. The educational function of the hospital must be evidenced in progressive, united and purposeful research.

Book Reviews

A System of Surgery. Edited by C. C. CHOYCE, B.Sc., M.D., F.R.C.S., Dean of, and Teacher of Operative Surgery in, the London School of Clinical Medicine (Post-Graduate); (Dreadnought) Surgeon to the Seamen's Hospital, Greenwich; Surgeon to the Great Northern Central Hospital. Pathological Editor, J. MARTIN BEATTIE, M.A., M.D., C.M., Professor of Bacteriology in the University of Liverpool; Hon. Pathologist to the Sheffield Royal Infirmary and Royal Hospital. In three large octavo volumes of about 1,000 pages each. *Volume III*, 501 pages; 34 plates in black and in color, and 342 text illustrations. New York: FUNK AND WAGNALLS Co., 1912. Cloth, the set, \$21 00, net.

The greater part of two years has elapsed since the first two volumes of this excellent system appeared. Those of our readers who are familiar with Volumes I and II will require no extended review of Volume III, and those unfamiliar with them will best be served by a repetition of the general impression of the work expressed in the earlier review (the JOURNAL, February, 1913, page 75):

"Although it is composed of individual monographs by about 50 English authors, it is far more acceptable than the usually rather disjointed and uneven 'system.' It also differs much from the common type of English medical works in that it has gotten away from the insularity that usually characterizes them. Indeed, this system appears English chiefly in its authorship. In text and bibliography it quite recognizes that surgery is a mosaic of international workmanship.

"We are pleased also with the prominence given to the pathology of the various diseases considered, and to their differential diagnosis. Operative measures are also re-

All that need be added is that the book has been brought completely up to date, the most recent developments in surgical technic having been added.

The Pathology of Growth Tumors. By CHARLES POWELL WHITE, M.D., F.R.C.S., Director, Pilkington Cancer Research Fund; Pathologist, Christie Hospital, Manchester; Special Lecturer in Pathology, University of Manchester. Octavo: 235 pages; illustrated. New York: PAUL B. HOEBER, 1913.

This is another book that attempts to discuss an immense subject within unreasonably small limits. In thirteen short chapters (the text is far shorter than appears, owing to abundant illustrations, large type and wide spacing), White attempts to cover the gross and histological features of tumors, besides such large subjects as regeneration, transplantation, the growth, origin, cause, and physiological and biological aspects of tumors. The result is that when one has finished reading the book, he feels that he has merely skimmed the subject. The work may serve a useful purpose as an elementary text book for beginners. It is of no value whatever as a work of reference. As an instance of the inadequacy of the text, we may mention that the entire subject of teratoma is dismissed in about three full pages. The book is written in a didactic manner, without a single reference of any kind. The illustration, nearly all microphotographs, are excellent and well reproduced.

Modern Surgery, General and Operative. By JOHN CHALMERS DA COSTA, M.D., LL.D.; Samuel D. Gross Professor of Surgery, Jefferson Medical College, Philadelphia, etc., etc. *Seventh edition.* Large octavo: 1,515 pages; 1,085 illustrations, some in colors. Philadelphia and London: W. B. SAUNDERS Co., 1914. Cloth, \$6.00 net.

In reviews of earlier editions we expressed the opinion that this is the best single-volume text-book of surgery in English. Of this edition we cannot say more, and we find no reason to say less.

The book is enlarged by only a dozen pages, but it shows careful revision and a conscientious effort to include all the important new facts in surgery.

Radium Therapeutics. By N. S. FINZI, M.B. (Lond.), M.R.C.S., L.R.C.P., L.S.A., Chief Assistant in the X-ray Department, St. Bartholomew's Hospital, London. Duodecimo: 112 pages; illustrated. London: OXFORD UNIVERSITY PRESS, 1913. Price, \$2.00.

This timely little work is a concise description of the various radium rays, radium emanations, and radium decomposition products of the action of radium radiations on the animal tissues, and of the methods of employing radium, uranium, thorium and mesothorium therapeutically. The work is very condensed, dealing with general rules rather than with statistical reports or clinical considerations.

Medical Gynecology. By S. WYLLIS BANDLER, M.D., Adjunct Professor of Diseases of Women, New York Post-Graduate Medical School and Hospital. *Third edition.* Octavo: 760 pages; 150 illustrations. Philadelphia and London: W. B. SAUNDERS COMPANY, 1914. Cloth, \$5.00, net.

A valuable feature of this revised edition is the enlarged chapter on disturbances of the glands of internal secretion. While there is much room for a better understanding of this subject, Bandler has appropriately incorporated into his medical gynecology what is known with a certain amount of definiteness concerning the derangements of the organs of internal secretion and their effects upon the general functions of woman as well as upon her general health. We feel after reading this chapter and

the rest of the book that we have been aided toward a more intelligent consideration of gynecologic disease and its more rational treatment.

Treatment of Sexual Impotence, and other sexual disorders in men and women. By WILLIAM J. ROBINSON. Duodecimo: 422 pages. New York: CRITIC AND GUIDE COMPANY, 1913. Price \$3.00.

This book, dealing with mooted and difficult questions, satisfies several very important demands. We have here a legitimate medical consideration of such matters as masturbation, pollutions, spermatorrhea and sexual impotence, which hitherto have been and even at the present time are still relegated largely to the wilful disposition of quacks. It is well to have an authoritative opinion as that given by the author in no uncertain terms about these borderline topics. In addition to Robinson's valuable instructions in diagnosis and these recommendations for appropriate medical and surgical treatment of these sexual disorders, his original literary treatment of the subject and the strong personality infused throughout his text are enough in themselves to insure for this work prompt popularity.

Chronic Ulcers of the Leg. By EDWARD ADAMS, M.D., Instructor of Surgery in the New York Post-Graduate School and Hospital; Attending Surgeon to the German Hospital, Out-Patient Department. Duodecimo: 127 pages; illustrated. New York: THE INTERNATIONAL JOURNAL OF SURGERY Co., 1914.

This small book is intended as a résumé of the various methods of treatment of chronic ulcers of the leg, and the results of these methods in the hands of the author. Adams has successfully accomplished his object, and we have, in his work, a desirable summary of the subject presented in a very simple way. Nothing new is offered, but most of the standard methods of treatment are well analyzed. The book should appeal to those who do not wish an exhaustive survey of the diagnosis and treatment of chronic ulcer of the leg.

Books Received.

The Clinics of John B. Murphy, M.D., at Mercy Hospital, Chicago. Published bi-monthly. *Volume III, Number 1.* Octavo: 190 pages; 91 illustrations. Philadelphia and London: W. B. SAUNDERS COMPANY, 1914. Price per year: Paper, \$8.00. Cloth, \$12.00.

Radium Therapeutics. By N. S. FINZI, M.B. (Lond.), M.R.C.S., L.R.C.P., L.S.A., Chief Assistant in the X-Ray Department, St. Bartholomew's Hospital. Octavo: 112 pages; illustrated. London: OXFORD UNIVERSITY PRESS, 1913.

The Pathogenesis of Salvarsan Fatalities. By SANITÄTS-RAT DR. WILHELM WECHSELMANN, Directing Physician of the Dermatological Department, Rudolph Virchow Hospital, Berlin. Authorized translation by CLARENCE MARTIN, M.D., St. Louis, Mo. Duodecimo: 143 pages. St. Louis: THE FLEMING-SMITH Co., 1913. Price, \$1.50.

Surgery: Its Principles and Practice. For Students and Practitioners. By ASTLEY PASTON COOPER ASHURST, A.B., M.D., F.A.C.S., Instructor in Surgery in the University of Pennsylvania; Associate Surgeon to the Episcopal Hospital; Assistant Surgeon to the Philadelphia Orthopedic Hospital and Infirmary for Nervous Diseases. Large octavo: 1141 pages; 7 colored plates and 1,032 illustrations. Philadelphia and New York: LEA AND FEBIGER, 1914. Cloth, \$6.00, net.

The Chemistry of the Duodenum; Its Comparative Value with the Indirect Methods of Testing Pancreatic Function. GLATZ. *Archives des Maladies de l'appareil Digestif et de la Nutrition*, March, 1914, page 121.

The methods of examination of duodenal contents are the accepted ones; the Einhorn Duodenal Tube is used; milk is employed as a test meal, and to carry with it, the tube into the duodenum. The chemical methods used are grossly qualitative, and no attempt at quantitative estimation of pancreatic activity is made. The stool is examined for trypsin by means of Schlecht-Müller plates of serum; the Sahli and Schmidt tests are also employed, as well as the adrenalin test of Lodi. The results were as follows:

Normal—10 cases—Bile and pancreatic ferments present in all cases. Glutoid capsule test of Sahli, positive 6, negative 3; serum plates, positive 8, negative 1; Schmidt nuclear test, positive 4, negative 5.

The reliability of the duodenal test and the unreliability of the other tests is easily noted.

Diseases of the gastro-intestinal tract—Including functional disturbances, gastric ulcers and carcinomata, and alcoholic liver cirrhosis. Twenty cases—bile and pancreatic ferments constantly present in all. Sahli glutoid test, positive 13 times, negative 5 times. Serum plates, positive 19 times, negative once.

PANCREATIC DISEASES.

1. *Cancer of Stomach and Pancreas*—Duodenal contents—bile present. Pancreatic ferments negative. Stool ferment tests and adrenalin eye tests all negative.

2. *Cancer of Head of Pancreas*, (confirmed at autopsy)—Pancreatic ferments absent. Bile not mentioned. Stool ferment tests, adrenalin eye tests negative.

The paper is valuable as showing in a large series of normal cases, and of gastro-intestinal diseases, the constant presence of bile and pancreatic ferments in duodenal contents and the irregular results with other tests. The Schlecht-Müller plates are more reliable than the others. In two cases of pancreatic carcinoma the pancreatic duct was found obstructed.

Cholecystitis Without Stones or Jaundice in Its Relation to Chronic Pancreatitis. W. J. MAYO, Rochester, Minn. *American Journal of Medical Sciences*, April, 1914.

Mayo calls attention to cases of chronic pancreatitis not associated with jaundice, in which at operation the gall-bladder is found undistended and free from stones, yet is nevertheless the seat of a chronic cholecystitis. The inflammation is characterized by the so-called "strawberry" appearance of the mucosa of the gall-bladder. The important point is that these patients are not cured by mere drainage of the gall-bladder. They are free of symptoms as long as the drainage persists; as soon as the opening closes the symptoms recur. For such cases cholecystectomy is the justifiable procedure.

A Method for Plicating Voluminous Ceci. JOSEPH A. BLAKE and J. N. WORCESTER, New York. *Medical Record*, April 4, 1914.

The authors' method is applicable to cases of large dilated ceca which give rise to a rather definite symptom-complex. The major symptom is pain in the lower right quadrant occurring in ill-defined attacks. In addition there is abdominal distension with gas, constipation and symptoms of intestinal auto-intoxication and gastric symptoms. X-ray examination shows the cecum low in the true pelvis, and poor emptying of its contents. At operation, the cecum is usually found mobile with a good mesentery, but the organ is unusually large and has thin walls. The authors do not believe the mobility has anything to do with the symptoms; rather these are due to lack of mobility and contractility. Blake's operation consists in passing a continuous silk or linen suture between the external and middle longitudinal bands; the stitch is carried aborally as far as is practicable, usually ten to fifteen cm., so that when tied the gut is contracted longitudinally as

well as transversely. In all cases the appendix is removed. The authors' analysis of their results in fourteen cases prove that the operation is of profound benefit.

A Case of Transgastric Excision of a Gastro-Jejunal Ulcer. B. G. A. MOYNIHAN and E. T. TATLOW, Leeds. *Lancet*, March 14, 1914.

This rather unusual case was ingeniously handled. Two years after a gastro-enterostomy was performed for duodenal ulcer there was recurrence of symptoms. At the second operation an indurated gastro-jejunal ulcer was found on the posterior opening of the gastro-enterostomy, which was patent and otherwise in good condition. An opening into the anterior wall of the stomach was thereupon made, the ulcer averted into the incision and excised. A temporary gastrostomy was also done. The patient made a perfect recovery.

Contribution to the Treatment of Duodenal Fistula. C. A. PANNETT, London. *Lancet*, April 18, 1914.

Sutures of a duodenal perforation resulted in a formation of a fistula. Four days later the condition of the patient was desperate. As a last resort, Pannett opened the abdomen, made a side-to-side anastomosis in the first foot of jejunum and then made a jejunostomy in the efferent loop. Food was given through this tube and through the mouth. The fistula immediately began to close and the patient made a perfect recovery. Pannett compares the advantages and disadvantages of this procedure with others that have been recommended for duodenal fistula—especially with the operation of Berg (gastroenterostomy with occlusion of the pylorus). He believes that his method will prove the method of choice.

Radium Treatment of Carcinoma of the Uterus. (*Zur Radiumbehandlung der Uteruskarzinome*.) R. KÖHLER and O. SCHINDLER, Vienna. *Wiener Klinische Wochenschrift*, April 9, 1914.

The authors report very favorable results in seven cases of epithelioma of the cervix, six of which were inoperable. A tube containing 29 mg. of radium bromide, enclosed in a platinum and lead shell was inserted into the tumor, through either a sloughing fistula or an artificial opening. A preliminary microscopic examination was made in every case. In every case, the patient thus far is free from tumor, not only clinically, but microscopically. In one case, a recto-vaginal fistula resulted from an extensive radium burn.

A Plea for Early Operation in Case of Uterine Fibroids. A. E. GILES, London. *The Medical Press*, February 18, 1914.

In an analysis of 580 cases of uterine fibroids, the author brings out a number of interesting points. He believes that gynecologists are too prone to put off operating on apparently simple cases of fibroids and that they should be taken over by the surgeon early for the following reasons: The age incidence of fibroid is so varied that no importance can be attached to age as an indication for operation. Early operation would often allow of a conservative myomectomy, when delayed operation necessitates hysterectomy. In a large proportion of cases fibroid tumors are associated with pathological complications, many of which are of a dangerous nature. Diagnosis is still so uncertain that grave conditions urgently requiring operation may be mistaken for simple fibroids. The mortality attendant on the procedures of myomectomy and hysterectomy in the practice of experienced surgeons has become so reduced that operation may legitimately be advised for the relief of suffering when life is not directly threatened. Early operation prevents the health and life of patients from being sacrificed to the exploded fallacy of "waiting for the change of life."

The Treatment of Carcinoma Uteri by Radio-active Substances. (*Zur Behandlung des Carcinoma Uteri mittels Radiaktiver Substanzen*.) L. LANDAU, Berlin. *Zentralblatt für Gynäkologie*, March 14, 1914.

Landau favors radical extirpation of the operable carcinomatous uterus because there may be metastasis in the

rimus which is a common source of infection, is not accessible to the radium rays at all. The twisted uterus, further, acts as a distal filter to the rays. In the vaginal radical operation, the pericervical parametria, as much as two centimeters at times, and the summit of the stump into the vagina, opens up wider field of exposure for the subsequent application of the radium or other radioactive substance.

On the Etiology and Bacteriology of Leucorrhoea.

ARTHUR H. COLEMAN, Chicago, *Surgeon, Gynecology, and Obstetrics*, March 1934.

Curtis reiterates the observations and displacements, cervical changes with increased mucous secretion, infection complicating pregnancy and puerperia, cause leucorrheal discharge. In his bacteriological studies he concludes that the uterine cavity tends to remain free from bacteria in cases of leucorrheal infection, although mucous secretion from the cervix may prompt the development of purulent discharge. The lower genital tract is the usual seat of the formation of purulent discharges, however. The development of chronic leucorrhea in unmarried women is usually preceded by infection with gonorrhea, the gonococcus preparing the soil for other organisms. The majority of the bacteria producing leucorrhea are anaerobes, Gram-negative bacilli predominating. The colon bacillus and the staphylococcus seem to be of secondary importance.

Attempts to Reduce the Time of Cure of Fibroids by Increase in the Dosage of the Roentgen Rays.

Ueber Versuche, die Heilungs-dauer bei der Myom-behandlung durch Steigerung der verabreichten Roentgen-mengen zu verkürzen. ERKIS VON GRAFF, Vienna, *Zentralblatt fuer Gynaekologie*, March 14, 1934.

Von Graff concludes from his experience in ten cases that an increased therapeutic effect may be expected by an increase in the portals of treatment—such as by employing the vagina—and by simultaneously diminishing the number of applications, although the dosage of the Roentgen rays shall remain high. The ideal result would be obtained by distributing the rays over eight to ten fields of exposure in such dosage that ten or twenty X would continue their effects to a depth of from six to eight centimeters, the average depth of the ovaries in the surface.

Two Cases of Tearing Away of the Uterus after Vaginofixation.

Zwei Fälle von Abreissung der Vaginofixationen. ERKIS VON GRAFF, Vienna, *Zentralblatt fuer Gynaekologie*, February 21, 1934.

Two patients upon whom a vaginal fixation had been performed, developed after a few days uterine perforations, respectively, one after two years, the other after a year and a half, sudden sharp pain in the abdomen. In both the uterus was found in perforation and a tearing of the vagina. The athermal coagulum was detected in the vagina. In the first case the atheroma was low down in the cervix and a fall.

A Case of Remarkable Fertility (Combined with Constant Bleeding in the Non-Pregnant Period).

Ein Fall von bemerkenswerter Fruchtbarkeit mit konstanten Blutungen in der Menstruationsperiode. ERKIS VON GRAFF, Vienna, *Zentralblatt fuer Gynaekologie*, March 14, 1934.

Pregnancy is a frequent result of the treatment of the uterus by the Roentgen rays. In the present case, six pregnancies have resulted from the treatment of the uterus by the Roentgen rays. The first pregnancy resulted in a stillborn child, the second in a stillborn child, the third in a stillborn child, the fourth in a stillborn child, the fifth in a stillborn child, the sixth in a stillborn child. The patient is a woman of 35 years of age, married for 10 years, with six children. She has been treated by the Roentgen rays for a long time. The treatment was successful in reducing the bleeding, but it did not prevent further pregnancies. The patient is now pregnant for the seventh time.

Spontaneous Supravaginal Amputation of a Myomatous Uterus Caused by Twisting on Its Axis.

Spontaneous supravaginal Amputation eines myomatösen Uterus durch Verwindung um seine Achse. ERKIS VON GRAFF, Vienna, *Zentralblatt fuer Gynaekologie*, March 14, 1934.

The history of the case is given. The patient was a woman of 35 years of age, married for 10 years, with six children. She had a myomatous uterus for many years. One day she noticed a sudden change in her condition. She felt a sharp pain in the lower abdomen and noticed a large mass protruding from the vagina. She went to the hospital and was found to have a supravaginal amputation of the uterus. The patient recovered well and is now healthy.

Treatment of Fibroids by Deep Roentgentherapy.

J. J. HAY, Syracuse, New York, *The Journal of Medicine*, April, 1934.

Levy comments upon the brilliant results obtained by Krog and Gauss in the treatment of fibroids of the uterus by x-ray. He states that 75 per cent can be cured by this method. The essential points in the treatment are: 1. Massive doses. 2. The use of a very hard tube, so that the more penetrating rays can be employed. 3. The tube must be near the part to be treated. 4. The use of a thick filter (aluminum) so that the soft rays which injure the skin can be excluded. 5. Crossfire technique. This means that the rays are allowed to penetrate the abdomen at a different site at each sitting. The dose is regulated by means of the Sauerbald pastille and the Kiesslock goniometer. The rays cure by causing atrophy of the ovaries and in consequence premature menopause. The older the patient the shorter the period of treatment. The method is not indicated in polynucleated fibroids or those undergoing malignant degeneration. Finally, the method is perfectly safe.

Free Transplantation of Bone Into the Phalanges.

S. L. HAY, San Francisco, *Journal American Medical Association*, April 11, 1934.

The treatment of acute and chronic osteomyelitis of the phalanges by bone transplant and the method that have been employed or suggested are taken up by Hay, who reproduces in brief the accounts of previously reported cases and two of his own. In each of the two transplant trials the phalanx with its periosteum, held in place after removal of the diseased bone with the necessary amount of the Feible tube and the method of treatment in one case while the other case results were being treated, the healed amount of flexion of the phalanx could not be obtained. In the second case, a part of the phalanx had been removed and the remaining part was held in place by a Feible tube. The results of the treatment were satisfactory. The author concludes that the method of free transplantation of bone into the phalanges is a valuable method of treatment of osteomyelitis of the phalanges. The method is simple and the results are satisfactory. The author also mentions that the method is not indicated in cases of acute osteomyelitis of the phalanges.

The Treatment of Acute Osteomyelitis of the Long Bones by Means of the Deural Engine and a Large Bone.

ERKIS VON GRAFF, Vienna, *Zentralblatt fuer Gynaekologie*, March 14, 1934.

The author describes a new method of treating acute osteomyelitis of the long bones. The method involves the use of a Deural engine and a large bone. The results of the treatment are satisfactory. The author also mentions that the method is not indicated in cases of chronic osteomyelitis of the long bones.

decayed and infected teeth is a matter of every-day occurrence to the dentist. With this idea in mind he has treated a series of cases of osteomyelitis by exposing the diseased tissue, painting with a solution of one part glycerin, and two parts iodine before making the incisions, and then using a large burr driven by a dental engine until it has removed every suspicion of decayed bone and left a smooth surface instead of the ragged edges left by the chisel and mallet. The operator readily acquires the ability to tell when the burr is working in diseased or normal bone by the greater resistance offered by the latter. With the burr he can safely operate where with the chisel and mallet it would be dangerous, and the chance of the heat and friction generated by the burr destroying the microbes is to be considered. It has been shown by cultures made from the inner surface of machinery belts that mechanical influence may produce an effective bactericidal action. One case is reported showing the success of this method, and, as the article is offered as a preliminary report, the publication of further data seems probable.

"Tango" Foot. G. F. BOEHME, JR., New York. *Medical Record*, April 25, 1914.

Boehme has seen seven cases of a rather typical syndrome, which in every case could be ascribed to dancing, according to the modern style. The patient complains of pain in the outer anterior aspect of the leg at its lower third. Stiffness in extension and flexion of the foot becomes marked and the patient limps; over the region of the tibialis anticus tendon pressure causes slight tenderness; at this region, the typical crackling feeling of a tenosynovitis is noticed. Boehme regards the tenosynovitis as due to the excessive flexion and extension movements at the ankle necessitated by the modern forms of dancing. Treatment consists in rest, massage and counter-irritation.

Bone Transplantation for Defects in the Long Bones. (*Beitrag zur Knochentransplantation in Defekte von Rohrenknochen*). DR. KORENCA, Vienna, *Wiener Klinische Wochenschrift*, March 19, 1914.

The author comes to some interesting conclusions from the observations of one case. About a quarter of the lower end of the femur in a boy nine years of age was resected for a small sarcoma of the bone. A piece of fibula covered by periosteum was inserted into the defect. Primary union was obtained, but a few weeks after the operation a fistula formed, discharging sero-purulent fluid. This persisting, the wound was reopened, and the transplanted piece of fibula, denuded entirely of its periosteum and partly necrotic, was removed. Despite this, the X-ray picture made four years later shows perfect continuity of the femur, with slight shortening of the lower extremity. The author concludes that the transplanted fibula served its function through the periosteum which it left behind. Korenca believes that the periosteum is the important element in restoring the continuity of a bone defect, and that it should be saved when possible in the course of bone resections. If this is not possible, the procedure carried out in this case should be attempted.

Epicondylitis (Frank) or Tennis Elbow. W. P. COUES, Boston. *Boston Medical and Surgical Journal*, March 26, 1914.

This injury most often occurs in tennis players, but may occur after any strenuous exercise involving the arm or even manual labor. There is pain in the elbow, accompanied by tenderness over the external condyle. The pain may be very severe, so that movement of the elbow is very painful, or the arm may seem paralyzed. The pain is increased by extension; may be intermittent or constant, and returns when the exercise is taken up again. After a period of weeks or months, with or without treatment, the pain and tenderness disappear. The cause of the trouble has not been cleared up, but the author suggests two possibilities: 1. "Tearing of some of the muscular attachments from the external epicondyle, giving rise to the separation of bony spicules." This was demonstrated in two of the three cases reported by the author. 2. "Injury to the radio-humeral joint capsule from antagonistic muscular

contraction of the supinator brevis and supinator longus (Preisner)." Heat and fixation appear to be the best methods of treatment.

A Case of Extensive Replacement of Tendons by Means of Free Fascial Implantation. (*Ein Fall von Ausgedehnten Sehnenersatz durch frei Faszientransplantation*). J. GÖBELT, Orlau. *Wiener Klinische Wochenschrift*, February 26, 1914.

Following an infected injury of the dorsum of the hand, all the extensor tendons of the hand, with the exception of the thumb, became completely necrosed and sloughed away. When the wound had completely healed, the dorsum of the hand was exposed by a large flap and defects in the tendons were found varying three to five cm. in length. Four broad strips were prepared from the fascia lata of the thigh. These were then sewed between the divided ends of the tendons in such a manner that the ends were rolled around the ends of the tendon while the intervening portions were made into a canal. Fine silk sutures were used. Despite some infection, the final result was excellent.

Indications for Intestinal Resection in the Radical Cure of Certain Herniae. (*Dans Indications de la Resection Intestinale dans la Cure Radicale de Certaines Hernies*). E. QUÉNU and H. CONSTANTINI, Paris. *Revue de Chirurgie*, April 10, 1914.

When strangulation or gangrene of intestine exists, the indications for the treatment of the bowel are fairly well defined. The authors, however, find that the treatment of the intestinal contents not strangulated but otherwise diseased has not been sufficiently considered. They have collected a number of these cases, and include their own as well. They find that resection may be indicated:

1. In some unusual instances of herniae containing tumors of the intestine.
2. In rare cases of localized tuberculosis of the intestine in the sac.
3. In adherent herniae when (a) the intestinal wall is considerably damaged in freeing it; (b) extensive avulsion of the serosa is the result of operative manipulations; (c) the intestine, freed from adhesions, is found covered with extensive scar tissue; (d) several loops of gut are found very intimately adherent to one another.
4. No definite conclusion for the treatment of intestine that is found in enormous herniae, and has no place in the abdominal cavity, has as yet been reached by the authors.

Profuse Hemorrhage in Tuberculosis of the Kidney: The Use of Adrenalin Injections as an Adjuvant to Treatment. R. P. CAMPBELL, Montreal. *The American Journal of Urology, Venereal and Sexual Diseases*, April, 1914.

Two cases of tuberculosis of the kidney are reported in which the hemorrhage was so profuse that the bleeding of renal tumor, or hemophilia, or "essential hematuria," was simulated. The first case was operated upon for "essential hematuria" after the cystoscopic examination showed that blood was spurting from one ureteric orifice and that there were no signs indicating tuberculosis; it was only when the capsule of the kidney was stripped preparatory to fixation that a small tuberculous focus was found. In the second case the very active bleeding was very well controlled by repeatedly washing out the renal pelvis with 1-3,000 adrenalin solutions.

Spinal Transplant. H. B. THOMAS, Chicago. *Journal American Medical Association*, April 4, 1914.

Thomas says that the non-operative treatment of tuberculous vertebrae is usually satisfactory when it can be continued over a long period of time. It is, however, impossible to control some cases so as to give rise to a firm ankylosis, and he illustrates these types by case-reports in one of which a transplant from the tibia is used. He asks, if this last case is not thus a better risk than if treated by long recumbency and braces. A shortened period of treatment is also a matter of consideration. The facts that should be considered in cases for operation are given as follows: "1. The general vitality of the patient. 2. The

Successful Resection of a Benign Tumor of the Liver. (*Tumeur Bénigne du Foie. Résection Partielle du Foie, Guérison.*) DR. TÉMOIN, Bourges, France. *Archives Provinciales de Chirurgie*, March, 1914.

The case is reported not merely because of its rarity, but because the symptoms, the course, the physical examination, all pointed to a cancer of the liver. Témoïn therefore believes that an exploratory laparotomy should be performed in all instances in which the diagnosis of cancer cannot be definitely established. The patient was operated upon by the author sixteen years before for cholelithiasis, and the gall-bladder was removed. She remained well until a year ago, and then began to complain of pain and vomiting. The physical examination indicated a carcinoma of the liver, as above indicated. At the operation the tumor was found incorporated in the right lobe of the liver, and appeared typical of a solitary carcinoma. The rest of the liver appeared normal. The tumor could be shelled out of the liver tissue without any difficulty, and the hepatic wound could be closed. Although it appeared, macroscopically, to be of cancerous nature, microscopically it proved to be inflammatory.

The Treatment of Granulating Wounds With Dry Air. (*Die Behandlung Granulierender Wundflächen mit Getrockneter Luft.*) H. POTH, Berlin. *Deutsche Zeitschrift fuer Chirurgie*, Vol. 127, Parts 1 and 2.

The apparatus devised by Kutzer was employed in all cases. It fulfills all the requirements laid down by Kutzer: the air is really dry, it is free from bacteria, its temperature can be regulated, and the air strikes the surface of the wound in currents. The one objection to the apparatus is its expense. Splendid results are described by Poth. The secretions from the wound rapidly diminish. The flabby granulations quickly regain tone and appear healthy; they gradually contract and thereby reduce the size of the wound. The ill-defined epithelial edge of the wound becomes sharply demarcated, and the surface of the wound is soon covered by epithelium advancing from the edge. The epithelial covering of the wound by this treatment is firm yet very elastic.

Massive Collapse of the Lung. W. PASTEUR, London. *The British Journal of Surgery*, April, 1914.

This is differentiated by the author from the commoner instances of partial collapse of the lung. The condition is of interest to surgeons because it occasionally follows operations and, especially, laparotomy. Pasteur believes that massive collapse of the lung is often unrecognized, the condition being generally designated "post-operative pneumonia." He describes the symptoms and physical signs that he believes are characteristic of the condition. It may at once be said, however, that the only positive diagnostic sign of massive collapse of the lung is displacement of the heart towards the collapsed side. If the collapse is bilateral the diagnosis cannot be made. The only practical advantage in making the diagnosis relates to prognosis: that of post-operative pulmonary collapse is almost invariably good; that of pneumonia is, as well known, not so good. The mechanism of production of lung collapse is not well understood.

Results of Three Years Clinical Work With a New Antiserum for Cancer. W. N. BERKLEY, New York. *Medical Record*, April 25, 1914.

This report is a continuation of a previous one made two years ago. The serum (preparation not given) is given intravenously or subcutaneously in doses of five to 50 c.c. at intervals of a few days. If any benefit is derived it is seen at the end of six to eight injections. The report covers the result in 71 cases, 32 secondary or inoperable, 39 treated after primary operation. In none of the 32 secondary or inoperable cases does Berkley claim a cure, but he reports a number of instances in which complete disappearance of the tumor resulted, and others in which there was improvement locally and symptomatically. The report on the 39 cases treated after primary operation leaves much to be desired in clearness. Berkley reports such cases "successful" which did not recur when treated by his serum after operation. Why the "success" should

not be entirely referred to a well-executed operation, we do not see. The author also reports a few good results in recurrences after operation.

A Magnetized Needle Holder. C. M. STIMSON, Philadelphia. *New York Medical Journal*, April 25, 1914.

Stimson finds that a magnetized needle holder is quite useful in locating needles or pieces of needles in the course of operations. Such a needle holder may save, therefore, a little time. Any needle holder may be magnetized by placing it on a dynamo for three or four hours. The magnetic properties are not affected by boiling.

Sciatica from the Orthopedic Viewpoint. JAMES K. YOUNG, Philadelphia. *The International Journal of Surgery*, March, 1914.

From the orthopedic viewpoint the most common causes for sciatica are strains and displacement of the sacro-iliac joint, due to acute or chronic traumata. In unusual instances sacro-iliac relaxation may depend upon general debility. Sciatica as a result of the sacro-iliac lesion is not of distinctive type, and if the joint affection cannot be diagnosed (by physical examination and x-ray), the other, less common causes of sciatica, must be considered. The author enumerates these. When the diagnosis of a sacro-iliac lesion has been made the treatment is clearly defined: If there is displacement, reduction and a broad pelvic band to immobilize the pelvis. If there is no displacement, the application of the band. Local application of massage.

An Additional Report on the Non-Operative Treatment of Carcinoma. (*Weitere Erfahrungen bei der nicht Operationen Behandlung des Krebses.*) KROENIG, GAUSS, KRINSKI, LEMBCKE, WAETZEN, KOENIGSBERGER-FREIBURG. *Deutsche Medizinische Wochenschrift*, April 9 and April 16, 1914.

Although the highly technical aspects of mesothorium and x-ray treatment of carcinoma cannot be reviewed here, the tremendously significant results of the continued work of these investigators should be noted. Their histological examinations have shown that there is no striking difference between the results of Roentgen and those of mesothorium therapy of cancer. The selective action of these two on cancer cells is about the same, and both show the same relatively innocuous effect on normal cells. Complete retrogression of deep-seated cancer has been induced by these investigators by both methods, and without any pronounced injury to the surrounding tissues, the complete retrogression of these cancers is now of two years' duration.

In cases of cancer on the borderland of operability, the results of Roentgen-therapy are greatly superior to those of operation. Roentgen-therapy should also be chosen instead of operation in operable carcinomata when the tumor is readily accessible to "cross-fire." This statement will of course not be definitely established until five years of Roentgen treatment for this group of cases have passed.

Congenital Tumors of the Neck. C. E. CALDWELL, Cincinnati. *The Lancet-Clinic*, March 28, 1914.

Caldwell describes a case of neck tumor in a boy aged eight. He calls the tumor a congenital multilocular lymphocele, and discusses tumors of the neck region in the light of recent studies in the embryology of the structures of the neck. He quotes the conclusions of Savelli, "Serous congenital cysts of the neck are lymphangiomas. The pathogenic theory that they are derived from ductless glands, should be abandoned. We think that the congenital serous cysts of the neck are due to an arrest of the development of the lymphatic system of the cervical region. This hypothesis is based on what the sections of embryos of different ages have shown us and on what we know of the vices of development of the lymphatic system. It explains all the anatomical peculiarities of congenital cysts of the neck." The work of Florence Sabin is also quoted as corroborating this, for it shows that the lymphatic cavities known as the "jugular sacs," described by her are the fetal *anlagen*, the abnormal development of which gives rise to the multilocular cysts of the neck.

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to reach the desired level of the conditions found in flies, so that the results could be obtained by any fly in the same strain or when it is realized that the larger number of the flies were referred to the same conditions as Dr. J. C. Goble, James C. Macfar, Wallace, and others, it is found that the same results could be obtained. The largest number of flies that were under supervision

sight any secretion there may be, and transfer is then made. A slide is then smeared with secretion obtained on a cotton-covered applicator. All the laboratory work has been done by my associate, Dr. Dwyer. With this technic, we have never failed to secure growth of one or more pathogenic bacteria, from which active autogenous vaccines have been prepared.

Of the patients treated, several had been coming to our clinic for years; others had been treated elsewhere until operation was proposed, while others denied ever having had any treatment. All cases were diagnosed and assigned for treatment by the examining surgeon.

It is unnecessary to describe the actual condition of each individual ear. Suffice it to say that almost every possible pathological change was found in one or other of these cases, including polypi, cholesteatoma, adhesive bands, fistulae, caries, and constrictions. The patients included the young and old of both sexes, and were drawn from all quarters. Dr. Rae had performed a most successful operation on one ear of a patient, and left the other to be treated with vaccines, and he is gratified at the excellent results obtained. Several patients had already been operated upon, but discharge persisted.

Although we have had about 118 cases assigned to us, comparatively few (thirty-three) have been given vaccine, owing to the fact that in the others all discharges were arrested by local treatment before the autogenous vaccines could be prepared, or they had not returned for treatment. Owing to the small number of cases and the short duration of observation, this paper is offered only as a preliminary report, from which no positive conclusions are to be drawn. Before this can be done, it will be necessary to treat several hundred cases and be able to follow them over a period of years, to obtain the ultimate effects.

Since beginning this investigation, we have had 118 cases assigned or transferred to us. Cultures have been taken in only fifty-two of these, and vaccines have been administered in only thirty-three of these. This is explained in three ways: In a large number of cases, the discharge stopped under careful local treatment; some failed to return; and a few objected to the hypodermatic injections. We have included in the list seven cases of mastoiditis which were cured by vaccines about a year ago. Three other mastoid cases have been cured this winter that are not included. Dr. Brown has also reported eight other cases, treated by vaccines for furunculosis, in which chronic middle ear suppura-

tions existing at the same time were cured by the vaccine. One case of otitis, still under treatment, had been operated upon twice in another clinic without relief, and was then referred to us, and is now practically well. Two cases were operated upon by another surgeon, but discharge persisted until vaccines were administered, when they promptly dried up.

Of the ten cases of mastoiditis, four were streptococcus infections; five, staphylococcus; and one, bacillus proteus vulgaris. All ten made prompt and complete recoveries.

We have not followed the dosage as used by Dr. Nagle, but have given much larger doses from the beginning, repeating every fourth or fifth day, and stopping as soon as the ears have become dry. The patients were then requested to report every two weeks for observation, so that any recurrence could be promptly noted. As Dr. Nagle states, under vaccine treatment the patient's general health almost invariably improves, this being especially noticeable in children.

In her first paper, Dr. Nagle reported that in a number of cases a stock laboratory staphylococcus vaccine had been given while waiting for the autogenous vaccine, and that marked improvement was frequently noted even when other bacterial infection was present, the resistance for the other bacteria being apparently raised by the stock vaccine. This interesting observation is clearly borne out in the eighth case reported by Dr. Brown, in which there were both furunculosis and middle ear suppuration present. His case, in which a mastoid operation had been performed and vaccines had been used elsewhere, is particularly interesting, illustrating again the importance of the personal element.

Four of our own cases were also double infections of furunculosis and chronic suppurations, and stock staphylococcus vaccines were given, with resulting cure of both conditions.

The first table gives the bacteria that were isolated in each case as the probable cause of infection.

A brief history of each case treated with vaccines and giving present results is presented in Table 2.

It should be noted that every case had received careful treatment for at least ten days before they received their vaccine, but had failed to respond. Those that did respond were not given vaccine.

As shown by the table, thirty-three cases received treatment with vaccines. Of these, two are noted as final "results unknown," owing to the patients failing to return after their ears became dry; eight were improved and are still under observa-

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14.	681313.	Strept. long chain, & Bac. Pyo.....	10 yrs.	1 yr.
15.	686877.	Bac. Proteus Vulgaris (Mastoid).....	25 yrs.	2 wks.
16.	690360.	Strept. long chain, B. Pseudo, Bac. Muc.....	15 yrs.	
17.	690843.	Bac. Pyo.	20 yrs.	1 yr.
18.	691349.	S. P. Aureus, Bac. Pyo. & unidentified bacillus.....	19 yrs.	4 yrs.
19.	691665.	S. P. Aureus.	28 yrs.	ysr.
20.	692763.	Stock vaccine	6 yrs.	2 yrs.
21.	693241.	S. P. Aureus.	7 yrs.	1 yr.
22.	694357.	S. P. Aureus.	22 yrs.	3 yrs.
23.	694382.	S. P. Aureus, & Bac. Pyo.....	25 yrs.	3 yrs.
24.	695352.	Stock vaccine	20 yrs.	ysr.
25.	695402.	S. P. Albus	26 yrs.	ysr.
26.	696015.	?	21 yrs.	ysr.
27.	696485.	S. P. Aureus	19 yrs.	5 yrs.
28.	697510.	S. P. Aureus & Strept. Caps. Muc.....	1½	3 mos.
29.	698144.	Stock vaccine	6 yrs.	4 yrs.
30.	698663.	Strept. Caps. Muc.	9 yrs.	3 yrs.
31.	699073.	S. P. Albus	8 yrs.	4 yrs.
32.	699348.	Bac. Pseudo-diphtheria	11 yrs.	2 yrs.
33.	701027.	Strepto. Caps. Mucosus	23 yrs.	8 yrs.

WITHOUT Cultures were taken and vaccines were made

1.	690811.	Bac. Pyo., & Bac. Pseudo., & Bac. Muc.....	15 yrs.	3 yrs.
2.	690813.	Bac. Pyo.	20 yrs.	2 mos.
3.	693257.	?	28 yrs.	3 yrs.
4.	694329.	S. P. Aureus	6 yrs.	1 yr.
5.	696034.	?	26 yrs.	ysr.
6.	696410.	S. P. Aureus, & Bac. Pseudo.	43 yrs.	1 yr.
7.	696928.	?	17 yrs.	2 yrs.
8.	696986.	Bac. Pyocyanus	23 yrs.	1 yr.
9.	697590.	Bac. Pyocyanus	4 yrs.	4 mos.
10.	699345.	No growth	28 yrs.	ysr.
11.	690286.	Bac. Pyo. & Bac. Pseudo.	5 yrs.	?

Under treatment for year past at irregular intervals. Developed furuncle. Gave 3 injections. Ears became dry and remained so far past month.....Cured
After 2 weeks of treatment was transferred for vaccine. All pain and discharge ceased after 2d injection. Two more given. Remained so.....Cured
Was treated without benefit for 2 weeks. Ears became dry after 2d injection and remained so.....Cured
Was treated without benefit for 2 weeks. Ears came dry after 4 injections. Recurred after 12 days. Advised ossiculotomy.....Improved
Marked improvement after 3 weeks' treatment. Vaccine then given. Ear dry after 3 doses. Eithmoiditis (S. P. Aur.) also cured for past 3 months.....Cured
Under treatment elsewhere for months. Both ears became dry after 2d injection. Remained dry for 6 weeks. Then slight recurrence. Renewed injection.....Improved
No improvement after 10 days' treatment. Ears dry after 2d dose. Recurred after seven days. Became finally dry after 5th dose. Dry 2 months later.....Cured
No improvement after 2 weeks' treatment. Ears dry after 3d injection and remained so. Arm infected by vaccine.....Cured
Ears improved under treatment but discharge persisted. Six injections given, but discharge persists. Mouth in very bad condition. General Eczema.....Improved
Ears became dry after 4th injection and have remained so at the end of six weeks.....Cured
No improvement after 10 days' treatment. Developed furuncles. Gave 5 injections stock staphylococcus vaccine. Ears dry for past 6 weeks.....Cured
Some improvement after 10 days' treatment. Ear dry after 3d day. Remained so to date.....Cured
Ear radical operation. Referred for R. ear. Ear dry after 6th injection for 2 weeks. Then slight discharge appeared. Still under treatment.....Improved
Received 5 injections, but at irregular intervals. Ears improved. Refused to continue his treatment unless regular visits.....Improved
Treated for month without benefit. Then gave vaccine. Ears dry after 3d dose. Remained so to date.....Cured
Gave stock vaccine because of furuncle. Ears became dry after 6th dose. Remained dry for past four weeks.....Cured
Under treatment at intervals for over 1 year. Vaccine given Feb. 4 and 8, 1914. Ears had remained dry up to March 6.....Cured
Has had treatment at many places. Gave stock Staphylococcus. Ears dry after 2d injection for first time in years.....Cured
Ears much improved after four injections. Still under treatment.....Improved
Has received 2 injections. Patient reports great improvement. Still under treatment. Mouth very septic.....Improved
Unknown, 2; Improved, 8; Cured, 23.

VACCINE.

For seven cases who made but one visit.

Ears became dry after 2d visit. Had remained so for two months when last seen.....Cured
Removed polyp. Ear dry after 2 weeks' treatment.....Cured
Removed polyp. Ear dry after eight days' treatment.....Cured
Had been under treatment for one month. Was then transferred for vaccine. Ear dry after 1st treatment and remained.....Cured
Ear had been operated upon 3 years previously. Discharge began 2 weeks ago. So much improved on 2d visit: vaccine not used.....?
Ear dry and remained so after 1st visit.....Cured
Offensive discharge. Distressing eczema. Ear dry and eczema well at the end of 1 week.....Cured
Ear dry after 1st visit. Remained dry for one week and has not been seen since.....Cured
Ear dry after 2d visit. Remained dry for one week and has not been seen since.....Cured
Removed granuloma. Ear dry on 2d visit. No improvement.....Cured
Made only 3 visits. No improvement.....Unimproved
Unknown, 1; Unimproved, 1; Cured, 9.

tion; twenty-three have dry ears and are seen about every two weeks. All have appreciated the personal interest shown to them, and it is fairly certain that they will return on the first indication of any discharge appearing.

As said before, all our cases, except those of mastoiditis, have been seen during the past five months only, and we are not justified in claiming absolute cures for them. We hope to follow them for several years, as has been done by Dr. Nagle,

and to report them again, possibly each year. In our minds, we are convinced that most excellent results have been obtained with the vaccines, especially so as many of our cases had resisted all other efforts, even failing to dry up after operation.

As so many cases have dried up under our local treatment, it may be interesting to state the methods employed. It is well to remember that in treating any suppurative process in the ear, it is necessary to keep all moisture out of the canal. If the

richer media, such as blood serum, ascitic agar, etc., and, if they proved to be organisms that were capable of identification morphologically and were known to have any pathogenic power or even regarded as remotely having this, vaccines were prepared and used even before the final identification of the organisms. Direct smears were also made and stained by aqueous stains and by Gram stains, so as to serve as a check upon the plates. All organisms were studied on the various media and identified.

In fifty-three cases we found the following organisms: *staphylococcus pyogenes aureus*, seventeen times; *staphylococcus pyogenes albus* and *citreus*, six; *streptococcus mucosus*, eight; *streptococcus hemolyticus*, eight; *pseudo-diphtheria* (Hoffmans' and Xerosis), fifteen; *pyocyanus*, sixteen; *proteus*, five; *Klebs-Löffler*, one; *bacillus mucosus capsulatus*, three. The *bacillus subtilis* and some other air-organisms were repeatedly found, but were discarded. In many of the direct smears, there were any number of spirochaete found, varying from that of Vincent to the refrigens and those found in the throat. It is my opinion that the true significance of the discharges from the middle ear will not be fully appreciated until an investigation is made of the rôle of these so-called innocent organisms from the throat, the torulae, spirochetæ, etc., so often found in this class of cases and always discarded. An arbitrary division of bacteria into pathogenic and non-pathogenic varieties is attended with many difficulties in the case of the ear, since potentiality for serious mischief in this organ which so many reputed saprophytes possess, renders such a classification of doubtful expediency. There are perhaps few organs which present a greater variety of bacteria than does the ear, particularly in the chronic forms of disease of this organ. Thus with the above technic, organisms, ordinarily looked upon as pathogenic, could be isolated in the big majority of cases, practically in 95 per cent. Some of these cases were of years duration and in all cases over months, so that the bacterial flora as time went on might have changed considerably, but the fact that pathogenic organisms could so be isolated encouraged us to try the vaccines in these cases. No anaerobic cultures were made and no attempt was made to isolate the acid-fast organisms or by animal inoculations and agglutination experiments to differentiate the various strains of streptococci, as our primary object was to have a practical method of isolation and one that could be easily applied. No attempt was made to differentiate the *bacillus butyricus* or its allied groups.

It is well known that in the chronic discharges we find very frequently acid-fast organisms that resemble the tubercle bacillus, but which under rigid staining decolorize, and it is probable that these are strains of bacilli that have been acted upon by the *bacillus butyricus*, an organism found very often in the ear and which is non-pathogenic in itself, but when grown in simbiosis with other organisms change these latter so that they have different staining reactions, and if an organism can be changed in this respect, it is not a far step to assume that it can be changed in other more important respects, as is well known with other sets of organisms.

With regard to the cellular elements, we think the study of these is well worth while. Under cytology, we may divide the cells into two groups, the epithelial and the mesoblastic. Epithelial cells are meatel, tympanic, or glandular. The commonest type is of course the squame, which in a healthy ear is absolutely confined to the meatus, but in chronic diseases invades the antro-tympanic cavity and becomes one of the most striking features of the discharge. These squames fall into two classes—the old and the young. The old are acid-fast, have either no nucleus or the area where the nucleus should be is only a shadow. On the other hand, the young or recently formed squames have large oval or round nuclei, which readily take the stain, are not acid-fast and are easily decolorized. We of course have all grades in between these two extremes. This point may not seem of much importance, but this acid-fast property of old non-nucleated squames affords not only presumptive evidence of a cholesteatomatous mass involving the antro-tympanic cavity assuming, of course, that the specimen was taken from the tympanum and not from the meatus, but fragments may be mistaken for the Tb. The normal tympanic epithelium is only seen in the early acute stage of infection; such epithelium does not occur in chronic discharges, the tympanic lining having been transformed into the squamous or epidermal type.

We next consider the mesoblastic cells and these may be divided into the wandering and the fixed cells. The wandering cells are very important. They comprise the leucocytes, the lymphocytes, and the plasma cells. The leucocytes and lymphocytes are usually classed as pus cells, but inasmuch as they are unlike in function, structure, and significance, some distinctions between them are necessary. The leucocyte of a recent or acute exudate is very sharply defined and the nucleus stains deeply, but degeneration soon sets in and we have well-known series of changes which are in-

ON THE TREATMENT OF FURUNCULOSIS
OF THE EAR WITH VACCINES.*

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Since the introduction of vaccine therapy, as suggested on a scientific basis in 1776 by Jenner, the number of research workers has been large, and most of the recent work in this field has followed lines laid down by Wright of London.

Although opposition to vaccine therapy was at first almost universal, even as late as 1910, when Dwyer furnished his very valuable article on the production and use of the vaccines, many of our profession were still loud in their denunciation of this form of treatment. Nearly five years have passed, and to-day one is safe in saying that owing to the painstaking and laborious work of the investigators in this field of work we have a therapy, the value of which can scarcely be overestimated and that, when used in the correct way, at the right time, we have in the His extract of leucocytes and in the vaccine agents for combating certain diseases that have no equal and the use of which has abundantly proved all that is claimed for them.

There are even now many physicians attempting to secure results from the vaccines, some of whom express themselves as having no faith in these remedies, and I am inclined to believe that such skepticism is the result either of a lack of acquaintance with the preparation used, or of using commercial vaccines, or of having used a wrong preparation at the wrong time, or upon the wrong patient.

At the very beginning it is necessary to recognize the fact that the His extract of leucocytes, the serums and the vaccines, are three independent and wholly different preparations, performing their work in the system by different physiological methods, and not all intended for use in the same patient at one time.

To consider now the vaccine therapy, in its relation to aural lesions, and particularly furunculosis, the foundation of this is the fact that when a foreign body, especially one of an albuminous nature, is injected into the human system, it stimulates the system to the formation of antibodies, which combat the offending organisms, and that each particular strain has power only to form antibodies of a corresponding nature in the system. It is easy to see that if the physician injects into a patient a strain

of staphylococcus vaccine, while the infecting organism in the patient's system is the streptococcus, the natural result will be failure.

Therefore, two facts are self-evident:

First: The right vaccine must be used.

Second: A correct diagnosis ought to be made before beginning treatment.

There seems to be no limit to the number of articles written upon this first question; what vaccine shall be used? The answer, without any hesitation, is, an autogenous vaccine.

Autogenous vaccines are procured from cultures made from the patient who is to receive the treatment. In autogenous vaccine the species of bacteria are isolated and grown in pure culture from which the vaccine is produced, and when used in a single strain, or in combination, the proper dosage is regulated at the time of administering it.

The so-called stock vaccine is in many cases the product from some original strain, kept no one knows how long, on artificial media in the manufacturer's laboratory, so that the latter vaccines made from this strain are quite changed from the original. The name "polyvalent" has been applied to a shotgun charge of mixed stock vaccines, the purpose of which is to hit a minute and possibly uncertain species of bacterium with a charge of therapeutic ammunition that will spread over a large area.

There is too often little correspondence between their contents and the organisms which they are intended to combat and moreover their use is unscientific and decidedly unfair to the patient.

In the foregoing I refer to vaccines for the treatment of furunculosis of the ear and allied aural conditions only, and while I do not assert that no good results have been secured by commercial vaccines in these lesions, I insist that the freshly prepared and autogenous vaccines are far superior to and yield much better results than the commercial, and should always be used when possible to secure.

The second question related to diagnosis. It is evident from what has been said about the formation of antibodies, that the first absolutely essential thing in the successful treatment of infectious conditions of the ear by vaccine is the establishment of a correct diagnosis. On more than one occasion have I heard from critics who have said that they have no use for vaccines, because they have tried them in every way, only to meet with disappointing results. Now, what has been the cause of these failures? Of course, anyone can put some pus on a slant agar, heat it to 60°, dilute it with saline solution and then inject the resultant mixture into an unsuspecting patient, and probably have failure, so

*Read before the Section on Otology of the New York Academy of Medicine, March 13, 1914.

No.	Name.	Sex.	Age.	Location.	Ear.	Duration, Prior Treatment.	Discharge.	Pain.	Injections, Amount.	Results.	Remarks.
28	J. E.	M	28	Diffuse.	L	3 Days	None	Yes	2	450	Cure
29	J. E.	M	28	Diffuse.	R		None	Yes	3	500	Cure
30	R. E.	F	31	Floor and anterior O. M. P. C.	L	6 Months	None	Moderate	4	300	Cure
31	L. S.	F	23	Floor and anterior.	R	1 Week	Yes	Yes	2	600 to 100	Cure
32	M. M.	F	35	Diffuse.	L	2 Weeks	Lanced four days ago	Yes	1	500	M.
33	J. W.	M	16	Diffuse.	L	1 Week	None	Intense on motion	2	300	One Staph. A. & A. One auto- genous S. Aur.
34	C. M.	M	29	Anterior wall.	L	7 Days	None	Intense	3 1/2	500 to 500	No pain after 18 hours.
35	M. R.	F	24	Diffuse.	L	2 Weeks	Lanced else where	Yes	3 1/2	600	Cure
36	F. S.	M	31	Floor.	R	8 Days	None	Moderate	2	500	Cure
37	M. R.	F	29	Diffuse.	L	10 Days	Was removed at other hos- pital	Intense	3	400	Cure
38	A. M.	F	42	Diffuse.	R	3 Weeks	None	Moderate	4	500 to 400	Cure
39	G. W.	M	25	Diffuse.	R	10 Days	None	Intense	1 1/2	500	Cure
40	F. W.	M	19	Anterior and floor.	L	3 Days	None	Moderate	2 1/2	500	Cure
41	M. B.	M	21	Anterior and floor.	R	4 Days	None	Yes	5	250 to 500	Pain gone after 10 to 12 hours.
42	J. J. K.	M	29	Anterior and floor.	R-L	3 Days	None	Yes	3	500 to 100	Cure
43	A. M.	F	45	Anterior.	R	1 Week	None	Yes	3	500	Cure
44	M. K.	F	49	Diffuse.	L	2 Weeks	Polysiliced by advice of doctor	Intense, no sleep		250 to 500	This furuncle had begun to abscess and had to be captured and dried up completely. Refuse vaccine.
45	A. P.	F	24	Diffuse enlarged cervical and mastoid glands.	L	2 Weeks	Orisville	Great	6	250 to 750	Patient has T. B. Came from Orisville with suspicious mas- toid glands. Mastoid glands and tender glands cervical. Canal was occluded by oedema. Lost 20 lbs. in weight when here. Received 500 cc. of Staph. A. & A. Aural condition and glands completely cured.
46	F. A.	M	11	Floor and anterior.	R	2 Weeks	None	Some	4	250 to 500	Cure
47	T. G.	M	26	Diffuse.	R-L	3 Weeks	None	Moderate	8	300 to 750	Cure
48	M. M.	F	38	Floor and O. M. P. C.	L	10 Days	Yes	Intense days	4	300 to 750	Cure
49	F. J.	M	50	Floor and anterior, much oedema.	L	2 Weeks	None	Intense, no sleep	4	300 to 750	No pain after 2d injection; thought to well and stayed home but received 6 more injections. Staph. A. & A.
50	J. McK.	M	6	O. M. P. C.	R	1 Year	8 Months	Yes	8	200 to 500	All pain and surrounding oedema gone after 3d injec- tion. Right ear has slight discharge at present.
51	A. O.	F	23	Mastoid & O. M. P. C. Diffuse.	L	2 Years 4 Weeks	Op. no cure in 4 weeks N. G.	No Much	9 4	250 to 500	Left ear is dry.
52	H. J.	F	20	Diffuse.	L	3 Weeks	None	Much	2	750 to 500	Did not return. Professional diver with traveling vau- deville. Canal was nearly well at two visits.

far as a good result on the lesion is concerned, but in the use of vaccine therapy it is just as important to establish a correct and definite diagnosis, if a good result is to be secured, as it is to be sure of one's diagnosis before beginning treatment of a heart or kidney lesion. Every man and every laboratory does not do this. For the successful treatment of these infected conditions of auditory apparatus, one must first know *what organism is doing the damage*, not only as regards the morphology, by aid of the microscope, but by a thorough study of a culture, and even if found necessary, by animal experimentation as well. In other words, a correct diagnosis must be made. It is not necessary in every case to employ every step of the process, just specified—for in some cases the condition is self-evident. The technic used by us is as follows:

The auditory canal is first irrigated thoroughly with boric acid or saline solution, or wiped clean with cotton, and then the canal is plugged with cotton impregnated with 95 per cent. alcohol, which is allowed to remain in situ for about fifteen minutes. The cotton plug is then removed and with the aid of a Siegel otoscope the pus is aspirated through the perforation. In this way the possibility of getting pure cultures is greatly aided. One avoids contamination from air organisms. Streak plates are then made on blood agar and ascitic fluid agar with the platinum needle or loop, and incubated for twenty-four hours, after which the colonies are fished and recovered on slant agar, or, as is more often the case, with us, on Dorset's egg media, to which a little ascitic fluid has been added. The vaccines are then prepared in the usual way from the pure cultures.

In dealing with furuncle cases, we can often recover direct on egg media or agar, without preliminary plating and fishing, as there is not so much likelihood here of contamination. But in the case of subacute and chronic otitis, we have found it necessary to carry out the above technic. The organisms are identified by all the means at our command, as morphology alone is quite untrustworthy in some cases. This identification by culture, and if necessary by agglutination tests, etc., takes some days, but we have been in the habit of making up the vaccines at once, and using them if organisms are found that are killed by a heat at 55° C. to 60° C. in one hour.

The process just described takes usually two days, and in order that no time be lost in attacking the disease, we give an initial dose of a pure staphylococcus aureus or albus culture. This is not the stock vaccine of the market, which is made of mixtures of different strains of bacteria of the same or

allied species, and is of uncertain strength and efficacy, but a vaccine made in our own laboratory from at least twenty to thirty strains of staphylococcus aureus, albus, or citreus, isolated at various times from a number of patients who are all suffering from a similar condition, and strains that have been freshly isolated.

When the patient returns for the next treatment the morphological classification has been determined as well as the cultural diagnosis made in the majority of cases. If we find that the infecting organism is one of those specified above, and corresponds to the organism of the vaccine used in the first treatment, and if there has been an alleviation of the symptoms and an improvement in the general condition of the ear, we generally continue giving the "home-made" stock vaccine. If, however, the organism is of a different type, an autogenous vaccine is ready for use for this, the second treatment. In some cases where the progress of the case has not been satisfactory enough to satisfy, under the use of our own "home-made" stock vaccine, an immediate beneficial effect has been obtained when the autogenous vaccine has been substituted. In brief: a scientific diagnosis is made with as much or even more care than is the usual physical diagnosis of disease, and it is to this fact that I attribute the success in the following fairly comprehensive series of 75 cases, with no failure to report.

Why all this care in diagnosis and the selection of vaccine?

Because the function of the vaccine is to stimulate the system to form antibodies and opsonins which combat the disease, and inasmuch as it has been shown that a certain bacterium will produce a certain antibody or a certain opsonin, and that that antibody or opsonin will be effective against that bacterium and against that alone, it is evident that the vaccine used must contain an antigen the same as the offending organism, otherwise no antibodies or opsonins will be formed and no result will be obtained, unless it may be a possible weakening of the system of the patient.

40 EAST 41ST STREET.

It is surprising how much information can be derived by abdominal palpation conducted with the patient in a hot bath, the temperature of the water being gradually raised to 105° F. It usually secures as much relaxation as does the administration of an anesthetic, sometimes even more. In addition to the avoidance of the dangers and the disagreeable features of narcosis, it has the important advantage that the patient is able to call the examiner's attention to sensitive areas.

TABLE 1. (continued)

Station	Location	Depth (m)	Temperature (°C)	Salinity	Density (kg/m ³)	Specific Heat (J/kg°C)	Thermal Expansion Coefficient (1/°C)	Sound Speed (m/s)	Viscosity (Pa·s)	Diffusivity (m ² /s)
1	10°N, 105°E	10	28.5	35.0	1025.0	4180	0.0002	1500	0.01	1.0

the 1990-1991 season, the discharge of the river was 100 km³ (Table 1). The discharge of the river was 100 km³ in 1990-1991, which was the highest discharge in the history of the river. The discharge of the river was 100 km³ in 1990-1991, which was the highest discharge in the history of the river. The discharge of the river was 100 km³ in 1990-1991, which was the highest discharge in the history of the river.

As a first case, we consider the discharge of the river in 1990-1991. The discharge of the river was 100 km³ in 1990-1991, which was the highest discharge in the history of the river. The discharge of the river was 100 km³ in 1990-1991, which was the highest discharge in the history of the river. The discharge of the river was 100 km³ in 1990-1991, which was the highest discharge in the history of the river.

Figure 1 shows the discharge of the river in 1990-1991. The discharge of the river was 100 km³ in 1990-1991, which was the highest discharge in the history of the river. The discharge of the river was 100 km³ in 1990-1991, which was the highest discharge in the history of the river. The discharge of the river was 100 km³ in 1990-1991, which was the highest discharge in the history of the river.

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develops a certain amount of resistance to the infecting organism, or else the organisms lose some of their virulence. Apparently, the discharge is kept up by the inflammatory reaction within the mastoid cells, which cannot be properly cleaned out, plus the continuous application of low-grade infecting bacteria. In no other way can I account for the unusual success attained in closing up these wounds after so much infection has taken place for so long a time, and getting them to heal by primary intention.

Latent mastoiditis is a condition which possibly is met with very often. I believe that frequently after the acute symptoms have subsided we often have to deal with a pus cavity in the mastoid, which sooner or later must be attended to, unless we wish the infection to go on to some complicating condition that will necessitate a far more radical measure.

11 WEST 81ST STREET.

PERIRENAL HYDRONEPHROSIS, PSEUDO-OR SUBCAPSULAR HYDRONEPHROSIS.

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When the urinary secretion finds its way under the fibrous capsule of the kidney, and dissects this away from the surface of the organ so that a pseudo-cyst is formed, we have the condition which has received various names, the most descriptive being *perirenal hydronephrosis*, *pseudo-hydronephrosis*, and *subcapsular hydronephrosis*. So little has been written concerning the pathology of this lesion, and the reported cases in the literature are so few in number, that it may be of some interest to report two cases that have come under my own observation.

Albarran, in his book,* describes this condition under the caption uronephrosis, regarding as subcapsular uronephrosis that form in which fluid accumulates under the capsule of the kidney. In these cases, he says, there is usually an orifice of communication between the kidney pelvis and the perirenal pocket.

Kaufmann, in his book on Pathology,** speaking of hydronephrosis, refers to two varieties of fluid accumulation outside of the kidney: pararenal hydronephrosis and perirenal hydronephrosis, the fluid

accumulations being under the fatty capsule in the former, and under the fibrous capsule in the latter type.

Babitzki,§ in an exhaustive review of the literature, concludes that these cases are rare, for he could find only twenty-two in the literature. His own case may be briefly cited, for it is typical of the condition:

In a patient 36 years of age, who gave symptoms of pain in the left flank, a large tumor developed two weeks before admission to the hospital. This tumor was fluctuating, apparently retro-peritoneal, and was diagnosed as probably involving the kidney. No urine could be obtained from the left side upon cystoscopy and ureteral catheterization. Nor did the indigo-carmin show any function on that side. Upon operation, a large cystic tumor was found which contained chocolate-colored fluid, and at the bottom of the cyst the surface of the kidney could be seen. It was apparent that this cystic tumor was produced by a rupture of the renal pelvis, the escaping urine leading to the formation of a pseudo-cyst.

According to this author a diagnosis was correctly made in only two cases of those recorded in the literature. If, in a case of hydronephrosis, there should occur a sudden increase in the size of the tumor and sudden pain, we would be entitled to think of rupture, and the possible production of a subcapsular hydronephrosis, although an escape of urine outside the capsule is more probable than under it.

The first case which I wish to report is remarkable, both because of the fact that there existed a congenital obstruction to the urinary outflow in the urethral tract, in an infant nine months of age, and also because of the presence of lesions of both kidneys: an infantile undeveloped kidney associated with a hydronephrotic kidney and subcapsular urinary exudation. Inasmuch as only the pathological aspect of his case was personally observed, I am indebted for the following brief excerpt of the history to notes taken on Dr. Gerster's service.

I. G., aged nine months, admitted to the Mount Sinai Hospital (service of Dr. Gerster), December 23, 1907, was reported to have had a great deal of trouble with urination for at least three months. The baby cried during each act of micturition and seemed to strain a great deal. For about a week an enlargement of the right half of the abdomen had been noticed.

On admission to the hospital, the child appeared to be fairly well nourished, but a mass extending

*Médecine Opératoire des Voies Urinaires, Paris, 1910.

**Spezielle Pathologische Anatomie, Berlin, 1909.

§Archiv. f. Klin. Chir., 1912, vol. XCVII., p. 993.

from the free border of the ribs down to the aortic ligament could be felt on palpation.

Nephrectomy was decided upon and a large subcapsular exudation around the hydronephrotic kidney was revealed. Deeply scurried, the autopsy showing an infantile, infantile, and hydronephrotic organ.

Pathological examination.—Lying in a somewhat thickened capsule, large enough to contain a body as large as a grapefruit (Fig. 1), is a small kidney. The sac is empty, its contents, a clear straw-colored fluid, have escaped at the time of operation. The intrarenal portion of the pelvis of the kidney is considerably dilated, and the parenchyma correspondingly diminished in volume.

The capsule is everywhere detached from the surface of the kidney, and here and there presents



Fig. 1

whitened and thickened areas, some covered with fibrinous deposit. About the middle of one surface of the kidney, and about 1 cm. from the convex border, there is an irregularly circular opening about 8 mm. in diameter. This establishes a communication between the pelvis and the subcapsular cavity.

More suggestive and enlightening as regards the causation of these subcapsular exudates is the history of the second case in which the title of transmigration was very evident.

H. T., 14 years of age, was admitted to the Har Mohan Hospital, October 25, 1913, with the history of having experienced a severe blow in the left upper abdomen and back some five years previously, followed by pains in the left hip and groin. At this time there was no blood in the urine, and his parent remember that he had no urinary trouble.

For the past five years he has had attacks of

flatulence, the pain occurring at intervals of two or three months. At these times the left hip and straight back were painful, and he was unable to lie down, or to get up without walking. At this time the urine was of normal color and volume, and contained no blood or pus.

On October 28, 1913, the patient was operated upon, and the left kidney was removed. The kidney was well defined, and the capsule was intact.

On October 29, 1913, the patient was operated upon through the abdominal wall, and the kidney was removed. The kidney was well defined, and the capsule was intact. The patient was discharged on November 1, 1913, and is well at this time. The patient was discharged on November 1, 1913, and is well at this time.



the kidney itself. The kidney was excised in the usual manner and the wound closed, a small tube being placed in as a drain.

The patient made an uneventful recovery. Urinary troubles were relieved after a week, and after two weeks the patient was discharged, well and cured.

We were exceedingly delighted to learn that the patient, after the removal of the kidney, had been cured of the urinary trouble.

On July 1, 1914, the patient was again operated upon, and the right kidney was removed. The kidney was well defined, and the capsule was intact. The patient was discharged on July 1, 1914, and is well at this time. The patient was discharged on July 1, 1914, and is well at this time.

there is a rent in one of the most prominent sacculations. This hole is ragged, some 6 mm. in length and its margins are covered with shred-like coaguli. There seems to be no doubt but that the escape of urine under the capsule had taken place through this hole. There is a number of other places where the substance of the kidney is so thin as to be distinctly translucent.

The features presented by our two cases may be briefly summarized as follows: In both instances there was a hydronephrosis with marked attenuation of the renal parenchyma; in one case a distinct history of traumatism could be elicited; and in neither case were the clinical data sufficient to arouse even a suspicion of the exact anatomical lesion.

FIVE HUNDRED CASES OF OIL-ETHER COLONIC ANESTHESIA.

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History.—The first public demonstration of ether as an anesthetic was given by Morton in the Massachusetts General Hospital in Boston, October 17, 1846. One year after this, rectal injection of fluid ether was verbally discussed by Roux before a meeting of the Académie des Sciences in Paris. This idea was actually carried out by Dupuy,¹ experimenting with dogs and rabbits. It was also mentioned in the same year (1847) by Pirogoff,² in St. Petersburg. His idea was to introduce liquid ether, but upon the advice of Magendie he devised a method of vaporizing the ether by means of heat and allowing it to pass into the intestine by the expansive pressure thus generated. Pirogoff reported eighty-one cases, with two deaths. Although he was very optimistic, thinking that this procedure might supplant inhalation methods, the results evidently did not warrant its continuance, as we read no more of it in the literature of the time.

In 1884, thirty-seven years after this first attempt, Mollière³ again revived the identical procedure, which was tried and reported upon in this country by Bull,⁴ Wier,⁵ Wancher,⁶ and Post.⁷ But because some cases were followed by marked diarrhea and melena and one death was directly traceable to the method, it was abandoned.

In 1904, Cunningham,⁸ of Boston, again revived rectal anesthesia, but with the radical difference of using air as a vehicle for the ether, instead of heating it. This was followed by such good results that it was taken up by Leggett,⁹ Sutton,¹⁰ and others. Sutton reported 140 personally conducted cases, with no deaths and no untoward after-effects. He

devised probably the best apparatus for administering ether in this manner. The distinctive features of his apparatus consist in having a mercurial manometer that automatically blows off at 20 mm. pressure, a generator for mixing oxygen and ether in nearly exact proportions, and tubes for conveying this mixture to and from the body.

Although very good results were obtained by Sutton in Roosevelt Hospital, under the guidance and supervision of Brewer—the operating surgeon who was also enthusiastic about the method—others did not have as good results, and the procedure again lapsed into disuse. There was no special reason for the abandonment of this ether vapor rectal anesthesia except that an extensive and somewhat complicated apparatus was required.

On August 6, 1913, I read a paper on "Oil-Ether Anesthesia" at the Seventeenth International Medical Congress in London.¹¹ The first successful clinical demonstration with oil-ether was on September 27, 1913, at The People's Hospital, New York City, upon a patient of Dr. I. M. Rothenberg, Dr. S. Rothenberg operating. This work was continued at Columbus Hospital, and was successfully demonstrated at other hospitals in New York City, then in neighboring cities, and the method is now being used with success in different parts of the country.

Animal Experiments.—Between twenty and thirty animals were used in experiments, and in only one instance did we lose an animal as the direct result of the anesthetic, and this was intentional. In succeeding experiments, before the dosage was determined, several animals were rescued from the danger zone by simply washing out the rectum. Autopsies were performed at irregular intervals upon others, and no contra-indication to the method was found. Although considerably handicapped by the short and small rectum of the dog, we persisted in these experiments until we obtained a perfect anesthesia in several successive cases.

Laboratory Work.—Experimental work with animals under the direction of Professor Wallace, and the laboratory work of Professor Baskerville, to determine the time of the separation of the ether from the oil has been reported. (See Bibliography, 12 to 14.) Wm. H. Park, Director of the Bureau of Laboratories of the Department of Health of New York City, states that the colon bacillus is killed in one minute by a 75 per cent. solution of ether in olive oil, the amount used with adults. A 50 per cent. solution kills the colon bacillus in ten minutes. As infection from the

assert itself would also indicate that an equal time would be given if any untoward symptoms should present themselves, and this is exactly what occurs. The factor of safety may be illustrated by citing one case in which a near-fatality resulted.

The case occurred in the Harlem Hospital. The patient was a woman weighing less than one hundred pounds, who received an overdose of both the preliminary medication and the mixture. Twenty grains of chlorotone and eight ounces of a 75 per cent. mixture were administered, whereas the proper dosage for such an individual is five grains of chlorotone and five ounces of a 75 per cent. mixture. She received four times the required amount of preliminary medication, and two-thirds more of the mixture than was necessary. The result was a respiratory arrest of eight minutes, but upon instituting the usual restorative measures she made an uneventful recovery.

Apparatus Required:—The only apparatus required is a rectal tube one-fourth of an inch in diameter and about twenty-eight inches long—the ordinary tube being too short—a clamp for this tube, a three-inch glass funnel, and a Lockwood tube about thirty inches long and three-eighths of an inch in diameter. These should be sterilized before use.

Improvements in Technic:—The technic has been considerably improved since the first report. One to two ounces of castor oil should be administered to the patient the night preceding the operation, care being taken to avoid purging. In the morning, irrigate until the return is clear, and allow the patient to rest for two hours or more.

Preliminary Medication:—No preliminary medication is required for children under nine years of age, but in order to obtain the most satisfactory results with adults, preliminary medication is essential. My own preference is to give per rectum—one hour before the time of operation—five to twenty grains of chlorotone in a suppository, or dissolved in two to four drams of ether to which an equal amount of olive oil has been added. As paraldehyde mixes perfectly with oil and ether in all proportions, it may be found that two to four drams of this fluid dissolved in an equal amount of olive oil and given alone—is preferable as a preliminary. As isopral, like chlorotone, has a slight local analgesic as well as a general hypnotic effect, this drug may be superior as a preliminary to the others mentioned. One-eighth to one-quarter of a grain of morphine, with one one-hundredth of a grain of atropine should be given hypodermically fifteen minutes after the

chlorotone or paraldehyde has been given.

For alcoholics and athletics, the following is suggested: Two hours before operation, give one one-hundredth of a grain of hyoscin hydrobromide hypodermatically, and one hour before the operation repeat the hyoscin with one-quarter of a grain of morphine. For these subjects, Sutton gives one-sixth to one-quarter of a grain of morphine, and 1/120 to 1/100 grain of scopolamine, hypodermatically, one hour before operation. With both the preliminary medication and the mixture, the patient should be in the Sims' position. If in a ward, the bed should be screened. No unnecessary exposure of the patient should be tolerated. At least twenty minutes before the time appointed for the operation, the 75 per cent ether-oil mixture should be administered very slowly through a catheter to which is attached a funnel, the end of the catheter having been well lubricated and inserted four inches within the rectum—allowing one minute for each ounce given. The patient will become unconscious in about five minutes, but full surgical narcosis is not usually reached before ten to thirty minutes. The time of narcosis is shortened by keeping the patient perfectly quiet and not allowing him to talk.

From a large number of cases, we have deduced the rule of one ounce of a 75 per cent mixture of ether in oil for every twenty pounds of body weight. For children, a mixture containing 50 to 65 per cent of ether is sufficiently strong. Thus we see that, according to the rule stated, an adult weighing one hundred and sixty pounds will require eight ounces of a 75 per cent mixture. No more than eight ounces should ever be given, regardless of the patient's weight. If a patient is too lightly anesthetized by this amount, it is better to supplement by inhalation than to increase the amount to ten or twelve ounces. In my own practice, two patients, women weighing 240 and 250 pounds respectively, were fully and deeply anesthetized with this amount of the mixture. A wiry, athletic, alcoholic subject, weighing 150 pounds would also take about the same amount. A child four to six years of age, would probably require just a little more than the one ounce for every twenty pounds of body weight. We run no risk with children, because the rate of absorption is much more rapid than with adults, so we can always proceed slowly with the introduction of the mixture. One-half to one ounce can be added later, if necessary.

From this time on, the patient should not be left alone. In ten to thirty minutes, the patient will

anesthesia the anesthetic is as completely under control as with inhalation methods.

The cases of oil-ether anesthesia concerning which definite information have been received, are as follows:

	Number
New York Post-Graduate Hospital, reported by Dr. Heyd, January 12, 1914	50
New York Post-Graduate Hospital, reported by Dr. Frazier	17
People's Hospital, reported by Dr. Robinson	20
Columbus Hospital	37
Smith Infirmary, reported by Dr. Wiltse	75
Dr. E. M. Foote	22
Dr. Mecker	14
Dr. Hubert Arrowsmith, Brooklyn Eye & Ear Hospital	50
Dr. Lombard	62
Dr. Cantle, March 20, 1914	24
Dr. J. T. Gwathmey (estimated)	140
	511

Comments of Others:—"The principal case of interest at The People's Hospital was a woman weighing about 75 pounds, with a temperature of 104 degrees, suffering from general diffuse peritonitis. This patient was held on three and a half ounces of a 75 per cent mixture for an hour and fifteen minutes. She made an uneventful recovery."

"In the fifty cases reported from the Post-Graduate Hospital, 8 were supplemented with chloroform. A trace of albumin was found in the urine about as often as when the inhalation is employed. There did not seem to be an indication to proctoscope any of the patients. In only three cases was there post-operative nausea and vomiting." Dr. Heyd's conclusion is that "where we had plenty of time to give the anesthetic properly, the results have been most satisfactory."

Not included in this list was a private case which also occurred at the Post-Graduate Hospital. The patient was a doctor's wife who had delayed having her tonsils removed for over a year, on account of very great fear of the anesthetic. This new form of anesthesia so appealed to her that she immediately decided upon an operation. The anesthetic was given to her in bed, without any complaint whatsoever, and the operation was entirely successful. However, a haemorrhoidal condition was made so much worse from the anesthetic that she had to be operated upon a few days later for this condition.

At the Smith Infirmary, a supplementary anesthetic was required in one-third of the cases. The

urine was negative as to pathological findings. Those who had been operated upon previously with an inhalation anesthetic expressed a strong preference for the oil-ether method. Many patients thought they were receiving an ordinary enema, and upon awaking after the operation asked when they were to be operated upon.

Dr. E. M. Foote states: "My general impression of oil-ether rectal anesthesia is so favorable that I shall continue its use."

Ten of Dr. Arrowsmith's cases were esophagoscopies. He reports the method as ideal for such cases.

Dr. Lombard states that in his series of cases the kidneys were less disturbed than by ordinary methods; that it is more satisfactory with children than with adults; and that it was more satisfactory with women than with men.

In two emergency cases of Dr. Mecker's (children), no preliminary preparation of any kind was given, yet the anesthesia was entirely satisfactory.

Five of Dr. Cantle's patients had taken ether before, and all agreed that this was the more comfortable method, the preliminary sensation of choking and suffocation being entirely eliminated and there being no unpleasant after-effects. All patients made good recoveries, with no complications.

Dr. John B. Murphy writes that he has used the method once. He states that the anesthesia was perfect and that he intends to make frequent use of it in his clinic hereafter.

In a private case, in my own practice—the patient being an insane woman—the mixture was placed in the hands of a nurse who gave it to the patient as she was lying on a sofa. This case also was ideal in every respect. I have the reports of several goiter cases in which no intimation of an operation was given, and the technic was carried out as outlined, with entirely satisfactory results.

My youngest case was a child two years old, satisfactorily anesthetized with a 50 per cent solution.

After-Effects:—The after-effects compare most favorably with the best methods of administering ether or chloroform. It has been given to consumptives, asthmatics, and to patients afflicted with bronchitis, and in no instance has the condition been made worse.

Indications and Contra-Indications:—It is especially indicated where the element of fear is in evidence, as in goiter cases; also with children and large athletic alcoholic men—cases in which occasionally a fatality results from fear. Large fat men and women are especially good subjects for this.

as a stimulus and since the publication the number of foreign bodies removed has increased enormously. Killian described the upper and lower methods of tracheo-bronchoscopy, the former of which means the introduction of the tube through the mouth, while the latter comprehends the passage of the tube through a previous tracheotomy wound. Each of these methods has its indications and limitations which will be referred to more particularly further on.

2. GENERAL REMARKS.

It may be well to preface the description of the different methods of examination by some general remarks on the appearance of the trachea and bronchi as seen through the tube. It is not necessary to dilate upon the fact that the bronchoscope must be smaller than the lumen of the trachea. When the bronchoscope enters the trachea, the part to be examined is a nearly round lumen and not a flat surface as in the larynx. One sees two inches or more beyond the end of the tube and it takes some practice to tell what is before the tube. Working in the trachea and bronchi is more difficult than laryngeal work because it is harder to judge distance. Another difficult problem for the beginner is to work successfully through the small tubes which of necessity must be used. The writer has made it a rule in his dispensary work to use the smallest possible tubes because he feels that it is good practice to introduce instruments through them and to accustom the eye to seeing through the smallest possible space. This practice makes operating through the larger tubes much easier. The ease of introducing tubes into the bronchi is accounted for by the fact that the tracheo-bronchial tree can be moved, according to Brunings, at least 10 centimeters at the bifurcation and the parts immediately adjacent to it. The trachea is moved from side to side with very little force.

3. CHOICE OF INSTRUMENTS.

Most operators seem to prefer Brunings' instruments for tracheo-bronchoscopy. They claim that they are more easily introduced; that the light never fails, as does the Jackson light when it is covered with secretion or blood; that the lumen of the tubes is larger and therefore easier to work through. That these are strong arguments no one can deny, but the writer is convinced that the advantages are more apparent than real. The largest Jackson tube measures 9 millimeters in the inside diameter, while Brunings has one of 12 millimeters. With the writer's method of introducing the bronchoscope, a Jackson tube of 12 millimeters can be

easily passed between the vocal cords in many adults, but there is no necessity for a tube of this diameter. When successful work can be done with a smaller tube and one runs no risk of injuring the structures of the larynx with it, it is useless to use the larger tube. The objection to the source of light in the Jackson tube is not serious if atropine is given before the examination to dry up secretions and one has a second light carrier loaded to introduce if the first one becomes clouded or burns out. If one uses a battery and is careful to have the lights just at white heat, there is not much danger of burning out the light. The writer has tried both Jackson's and Brunings' tubes; he prefers the former because he is convinced that the light is better when one is working far down in the bronchi. The great advantage of the Jackson tube is that one has an open surface to work through, while with the Brunings' instrument the forceps must be introduced through the slot in the mirror. The question of instruments is, after all, of secondary consideration. The beginner should learn with one set of instruments and stick to them, for one can do the best work with implements that one is accustomed to.

4. CHOICE OF METHOD.

In this country, following the teachings of Jackson, the lower method is being used less and less. In European countries it is better to quote Brunings, who says: "If statistics are consulted, it will be found that in Gottstein's series the upper method was followed in 37 per cent., the lower method in 37 per cent., and the two methods in 17 per cent. of all the cases, showing that upper and lower bronchoscopy were practised equally. The proportion is rather different when the numbers are taken with regard to different ages, as I have done in the following table:

Age in Years. (1)	Lower Bronchoscopy. (2)	Upper Bronchoscopy. (3)	Upper and Lower. Bronchoscopy. (4)
0-6	47	33	20
7-12	32	53	15
13-60	24	52	24

It is seen that the frequency of tracheotomy after the age of six rapidly decreases, and after the twelfth year decreases still more. Of course, the cases in the fourth column (upper and lower bronchoscopy) are not included. These belong all nearly to the second column, because, as the upper method is impracticable, tracheotomy had to be performed. It must be remembered in the interpretation of these statistics that the cases in question were all of an operable character (foreign bodies), and that

to cope for any length of time with such increased demands. If the operation is performed without an anesthetic, an excessive prolongation of the operative shock, together with the two other drawbacks, may lead to fatal collapse. When there is no danger in delay, difficult bronchoscopic operations should be distributed over several sittings than that the duration of the tube introduction should exhaust the patient. Several carefully considered examinations generally yield a better result than a single forced sitting. I call to mind the extraction, carried out by Killian and myself, of a bronchial foreign body which extended over ten sittings, some of which attained the great length of two hours. It is not possible, of course, to state a normal period or maximum period for the duration of bronchoscopic operations. As a rule the tube has to remain on its place from five to fifteen minutes. In one favorable case I was able to extract a bone from the right main bronchus in less than three minutes (counting from the moment when the tube was first introduced). Fortunately the dangers already enumerated, which are generally avoidable, are almost the only ones which are connected with bronchoscopy proper. In order to state the actual position, I give Jackson's statistics for ninety-four cases of upper and lower bronchoscopy of foreign bodies, with a mortality of 9.6 per cent. Six of these cases Jackson himself deducts because the examinations were undertaken on patients who were in such a condition that a fatal termination was to be expected. This leaves only 3.2 per cent., of which 2 per cent. occurred in children, which bears out what has been said above."

In these remarks by Brunings there are several things to which one may rightly take exception. First of all, the upper operation is more popular in this country than the lower, and in the average case is just as easy to carry out. The writer has never had occasion to perform tracheotomy for the removal of a foreign body in an adult; in children, where the difficulties are much greater, he has had to do the operation once following the removal of a watermelon seed from the trachea of a child, two years old, for edema of the glottis from pressure of the bronchoscope. Jackson points out that edema is much more apt to occur after the use of large than small tubes, and it would seem that the use of Brunings' tubes, which are larger than Jackson's, would lead oftener to tracheotomy. This is one reason why the writer prefers Jackson's tubes. The writer cannot agree with the statement that lower bronchoscopy is technically easier to carry out; the simple introduction of the instrument may

be so, but it is not such a simple matter to do a tracheotomy in a little child, and these are practically the only patients who require the operation. The entire procedure is more difficult in the writer's opinion than the careful introduction of the tube between the cords. That there are conditions arising in tracheo-bronchoscopy that require tracheotomy is undoubtedly true, but the bronchoscopist should endeavor to become so skillful in introducing the tubes and in manipulating instruments through them that the indications for the operation will become less and less. If one has trained the eye to work through small tubes, one will gradually become so expert that the removal of the average foreign body will take only a few minutes, which will cause no damage to the larynx. Edema of the glottis following extraction of foreign bodies is caused either by the use of a large tube or the prolonged pressure of a small one. It behooves bronchoscopists, therefore, to work as rapidly as is consistent with safety. In the case of infants, Brunings believes that the lower method alone is available. In these cases the trachea is so short that one may occasionally be able to remove the foreign body through the direct laryngoscope by introducing the forceps between the cords; or the 5-millimeter tube may be carefully pushed between the vocal cords when the foreign body usually comes into view if it is of any size. A foreign body must be very small to enter the bronchus of an infant. In view of these facts the writer is opposed to tracheotomy in infants until a fair trial of the upper method has been instituted. The tube should never be kept in the trachea long at the time; if after a few minutes the attempt proves unsuccessful, one should try again another time. Brunings' objections to the prolongation of the examination because of possible cocaine poisoning are answered by the substitution of alpin which will allow one to work a long time. The writer has frequently kept the 9 millimeter in the trachea and bronchi for thirty minutes or longer in demonstrations without the slightest harm to the patient. He would not hesitate to keep it in longer if it should be necessary. The only discomfort is slight hoarseness, which passes off in two or three days.

It is scarcely necessary to impress upon laryngologists the importance of strict asepsis in tracheo-bronchoscopy. All metal instruments should be boiled, the small lamps should be sterilized in small glass tubes, and the light carriers immersed in carbolic solution. It is better to pay some attention to the mouth such as cleaning the teeth and washing out the mouth with 30 per cent. solution of alcohol

chea, it is a good rule to draw the tube up and move it from side to side until it is seen. The picture which the bronchi will present will be described under upper tracheo-bronchoscopy. The color of the mucus membrane of the trachea varies from a light to a dark pink color; adrenalin blanches the color of the membrane materially. As operators become more expert, the lower method will be used less; in the treatment of stenosis of the trachea it helps greatly in getting at the trouble, but exposes the patient to all the dangers of the tube wearer. In one case of stenosis treated by the writer, tracheotomy had to be done hurriedly to save life. The writer believes that tracheotomy is seldom justifiable in tube work. That lower tracheoscopy is easier than the high operation to the beginner goes without saying, but to the expert operator, who has introduced the tube a number of times, the high operation is not difficult. Jackson has made the remarkable statement that he prefers to do the high operation even when a tracheotomy wound is present.

(To be continued.)

THE RADIOGRAPHY OF GASTRIC PTOSIS.

Given a case of suspected gastropsis, the roentgenologist first determines whether or not the typical roentgen picture of the condition exists, giving due consideration to the anatomical type of the individual. Following this, he observes the extent of ptosis, the degree of atony, and delay in the emptying time. Next, he must be assured that the position of the stomach is not due to extragastric causes, such as pressure or traction. Knowing that an apparent ptosis may exist without symptoms, he must determine whether the atony and dilatation and the other factors in retention are those truly associated with a gastropsis, or arise from other causes, such as pyloric spasm, pyloric obstruction or duodenal stasis from traction on the mesentery through adhesions of the ileum or a ptosis of the right half of the colon.—H. K. PANCOAST in *The Pennsylvania Medical Journal*.

A tender, painful swelling just at or below the upper, outer border of the breast, and near the edge of the pectoralis major, is usually an inflamed lymphatic gland. In its presence it is well to look for some skin infection about the waist line, e.g., furuncles, which are not rare at this site as a result of irritation by the corset. Per contra, with a boil, abscess, dermatitis or other infection at or above the waist line, one may be on the lookout for glandular enlargement at the point referred to.

SPLENECTOMY FOR SPLENIC ANEMIA— REPORT OF A CASE AND DESCRIPTION OF THE OPERATION.*

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Splenic anemia was first systematically described by Banti in 1883 although the disease had been known for some twenty years before. For years after this, isolated cases were reported, until in 1902 Osler brought the subject again into prominence. The etiology is unknown. The disease, while supposed to be very rare, is really not infrequent. Most of the cases reported have been in males. The disease occurs at all periods of life, but cases in very young children are not common. The patient (Fig. 1) here reported, is of a child but $5\frac{1}{2}$ years old. In several cases reported there has been a family incidence. Banti describes the disease as having three states: first, enlargement of the spleen with anemia of a secondary type; second, enlargement of the liver; and third, the ascitic stage. The diagnosis is relatively easy if the disease is thought of. It is made on the enlargement of the spleen with a secondary anemia and without much variation from the normal of the white cells; usually the number of white cells is, if anything, decreased. The conditions which are to be differentiated are splenomegaly without anemia, splenomegaly with anemia dependent upon various infective processes such as syphilis, tuberculosis, malaria, uncinariasis, kala-azar, malignant endocarditis, septicemia, etc.; pernicious anemia, leukemia, Hodgkin's disease, splenomegaly following cirrhosis of the liver and interference with the portal circulation.

Splenectomy has been done in these cases ever since Banti's original paper and is advocated on the hypothesis that the seat of the trouble is the disturbed metabolism of the spleen. However, this may be, it is certain that this disease not treated by splenectomy terminates eventually in death in a majority of cases; while splenectomy done in the early stage is curative. Of ninety-eight cases** of splenectomy for splenic anemia done in various stages of the disease, seventy-seven recovered and twenty-one died, a mortality percentage of 21.4 per cent. Collected statistics do not give an accurate understanding of the mortality, as fatal cases are not reported unless of special interest through the pathological findings. Statistics of individual observers are much more illuminating. Interesting in this connection is the report by Richards of twenty-

*A. Clinical Lecture at the Methodist Episcopal Hospital, April 11, 1914.

**Collected statistics of Bessel-Hagen, Johnston and Deaver

two cases of splenectomy, with four deaths, for Egyptian splenomegaly, a disease which is quite similar to Banti's disease. Two of these cases were in the final stage of the disease. Excluding these two cases the statistics show a mortality of 10 per cent., while in eighteen cases of splenectomy for splenic anemia by Mayo there was a mortality of 11½ per cent. As just stated, the benefit the patient derives from splenectomy depends upon the stage in which the operation is performed. "Done early the operation is curative." Of thirty cases collected by Banti, including ten of his own, four were operated upon in the first stage of the disease, of whom three were cured; twenty-two were operated upon in the second stage, of whom thirteen were cured; four were operated upon in the third stage, of whom one was cured. Of the eighteen cases operated upon by W. J. Mayo, two died as a result of the operation; twelve were well from one to seven years after the operation; two were improved; one died three years after the operation, showing improvement until shortly before death; one died two and a half years after operation, cause unknown. The final results of the cases operated upon by Richards and Aly Bey for Egyptian splenomegaly show that eighteen cases were successful in that the patients left the hospital in better condition than when they entered. "These cases were seen nine months to two and a half years after operation and were in good condition, some of them doing hard physical work."

The history of this case is as follows:

E. P., admitted January 30, 1914, aged 5½ years, male, and subsequently referred to me for operation by Dr. Raymond Clark, attending physician. Chief complaint, pain over whole abdomen. No similar cases in family; no chronic diseases. Patient was always well until last summer (1913), when he had a very mild attack of scarlet fever. Since then he has not shown the same desire to play. Soon after recovery from scarlet fever and again on January 23, 1914, had severe cramp-like pain in the abdomen. In the second attack he had a severe nose bleed. The abdominal condition was met by a dose of castor oil and hot applications to the abdomen. Next day he appeared well. There was a third attack on January 23, with severe abdominal pain which was not relieved by previous methods. Pain continued all night; the bowels did not move; no history of vomiting; appetite has been good. Physical examination at time of admission: patient appears to be in good health. Mucous membranes are pale. Eyes, ears, nose, and mouth are apparently normal. Thorax, expansion good and equal on both sides, no adventitious sounds heard. Percussion normal. Heart, normal size and position; rate rapid, no murmurs or accentuations. Later a murmur developed as a result of the profound anemia.

Abdomen, liver 18 cm. below xiphoid enlarged almost to the third cost, 20 cm. below umbilical organs palpable. On February 10, liver was palpable below costal margin. On May 21, upper border was in fourth space, lower border 10 cm. below costal margin. Hind found in 10th ribs. On April 4, lower border 7 cm. below costal margin, vertical diameter 11 cm. During the first twenty-seven days in the hospital the temperature held about normal. He then had a severe epistaxis bringing the pulse from 110 up to 140. After that the temperature varied from 98° to 101°, with an afternoon rise each day. Seven days later he had another epistaxis and a third five days after this. After a two-day interval he again bled, then went a week before having his fifth nasal hemorrhage. By this time the patient had developed an ascites. On the fifty-sixth day in the hospital temperature jumped to 104.4°, pulse 160, respirations 60. Four days later temperature, pulse, and respiration had re-



Fig. 1. Patient in hospital.

turned to normal after a rigid diet of cream soups of fluids. After staying normal for a few days on the sixty-sixth day in the hospital the temperature began a daily variation, reaching 102° or 103°, and at some time during the day dropping back to normal. This type of temperature was maintained for nine days, when splenectomy was done. Ever since eight days after admission (one day after operation) have tarry stools been noticed. Blood count shows a persistent high color index, with a marked anemia but no megaloblasts. Erythroblasts were quite numerous from the onset. Ten separate blood examinations show an average red cell count of 2,000,000 and an average hemoglobin percentage of 56. The leucocytes have varied markedly, usually ranging around 11,000 but in one case reaching 30,000. The polymorph count has been low throughout, averaging about 43 per cent., once as low as 23 per cent. Other examinations: Wasserman, negative; von Papanicolaou, negative; stools negative for paras-

sites or ova; blood culture was sterile. Treatment has been entirely hemotinic, using Zambelletti and later sodium cacodylate and local treatment of oozing nasal mucosa with adrenalin. The bed has been outdoors practically all the time. The diet has been simple, with an eye to improving the blood with such things as oatmeal, green vegetables, etc.

COMMENTS DURING THE OPERATION.

The child now is in about as good condition as could be secured. Almost the entire success of this operation depends upon whether or not we will be able to remove this spleen without hemorrhage. In addition, artificial warmth will be applied to the patient during the course of the operation. All clothes and pads used in connection with the operation will be warm. In a case such as this in which the diagnosis is quite certain one has the choice of any incision. In adults the incision of choice would be the Auvray incision (Fig. 2), which, briefly, is as follows: The primary incision is made in the usual manner along the outer border of the left rectus muscle extending up to the costal cartilages. It is particularly indicated in difficult cases. Exploration having shown the case to be a difficult one requiring more room at the upper end of the incision, this is extended upward and posteriorly over the lower ribs at the level of the eighth interspace. The flap of the soft parts is dissected outward so as to show the eighth, ninth, and tenth ribs. This cartilaginous segment is now excised by dividing the cartilages close to their anterior extremities and freeing the segment from before backward and below upward, keeping close to the ribs during the dissection. Finally the excision is completed by separation of the segment a little anterior to the costochondral juncture. In this case we have made a skin incision as described by Auvray and have entered the peritoneal cavity in the usual manner along the outer border of the left rectus muscle. In children, however, it is not necessary to excise the lower segment of ribs, but the incision is now carried across the costal cartilages so as to allow of the introduction of a broad retractor pulling the lower part of the costal arch upward and to the left so as to expose the vault of the diaphragm. All bleeding from the wound has been stopped and wherever possible vessels have been caught before they were sectioned. A warm laparotomy pad is now introduced into the wound and all bleeding points ligated. I stand upon the patient's left, as I find it easier to do the operation from that side, except possibly the ligation of the splenic pedicle. In the splenectomies which I have performed I have not found any difficulty from standing in this position. Jonnesco advises that the operator stand at

the patient's right in order that the pedicle may be better inspected. The bleeders now having been tied off, the left hand is gently inserted into the abdominal cavity on the convexity of the spleen and swept over the diaphragmatic surface. Here we find a few adhesions; there is also on the outer side an adhesion of omentum of the abdominal wall. This adhesion is not separated, as any other procedure except the splenectomy is to be deprecated. Exploration of the lower pole of the spleen does not reveal any adhesions. The lower pole is not allowed to come out of the wound and the colon, which presents at this moment, is gently pushed back with a warm laparotomy pad. A warm gauze pack one yard square is now ready; this will be introduced and packed against the diaphragm as soon as the upper pole of the spleen is separated from it. I make this separation quickly, but do not allow the spleen to snap or come out forcibly so as to make undue tension on the pedicle. Too quick or forcible removal of the spleen may rupture the delicate veins of the pedicle. The diaphragmatic pack is now introduced while the spleen is steadied by an assistant and held in such a manner as to cause the least possible tension on the pedicle itself. As the spleen comes out of the wound it can be seen that part of the fundus of the stomach and part of the transverse colon came with the pedicle. A warm laparotomy pad is placed against the fundus of the stomach. So far there has been not one drop of blood lost except a teaspoonful or so which came from the oozing of the abdominal wall.

The pedicle of the spleen requires particular and careful attention. It is composed of six to twelve branches of the splenic artery, each artery going to a different part of the spleen and not anastomosed with its neighbor. The veins accompany the arteries. A gastro-enterostomy clamp, the blades of which are protected with rubber tubing, is now passed about the pedicle of the spleen. In this case, since the pedicle is short, the clamp is placed one inch from the splenic tissue itself. We would like to get a little more room to doubly ligate the pedicle and so prevent the soiling of the wound from the escape of the blood contained in the spleen. In this case it is not possible. We must be content to place the gastro-enterostomy clamp so as to include the tail of the pancreas and part of the stomach. The clamp is now set so that there is no longer any danger of hemorrhage. The pedicle is ligated in sections, taking care that the needle carrying the ligature does not injure the vessels. The spleen is now cut away. There is some escape of blood from it. This could have been avoided had it

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WALTER M. BRICKNER, M.D., Editor

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METHODS OF BLOOD TRANSFUSION.

When George Crile re-introduced blood transfusion as a now safe procedure he made a monumental and probably permanent contribution to medicine. Nor was that contribution merely one of method, which would have been important enough in itself; it included also a thorough study of the effects, under various conditions, of the transfused upon the recipient's blood and the laboratory contraindications supplied by hemolysis and agglutination. He provided, too, in his monograph, and in other publications, caustic studies that supplied a clear basis for the indications for transfusions—which have subsequently been added to but not otherwise much altered. Crile's success depended upon abandoning the old indirect method of transfusion, with its inevitable clotting, in favor of a direct method, by which, for the time of the operation, the donor's and recipient's vascular channels are made continuous or, in other words, an uninterrupted tube of bloodvessel intima was provided in which the blood might flow from one body to the other without clotting. Most simply to effect this temporary vessel anastomosis Crile devised a cannula (or, more properly, set of cannulae), suggested in its form and purpose by Payr's ring.

Crile's cannula is still widely used, although it has been much modified by various men. Notable among the modifications and mechanical improve-

ments are Soresi's cannula and the admirable instrument of Elsberg. Carrel's suture anastomosis has also been much used in blood transfusion but, for obvious reasons, it could not compete with the cannula anastomosis as a routine.

The method of transfusion introduced by Crile and still widely employed is that of an arterio-venous anastomosis by which the donor's radial artery was sacrificed. This involves not only a rather delicate dissection but also a disfiguring scar. Vein-to-vein transfusion, now also much used, is quite as satisfactory, technically at least as simple, and certainly less mutilating. Less extensive dissection of the vessels is required when the communication is established through a paraffined glass tube, but this method has not won any general acceptance and the use of an animal tube, composed of a preserved segment of dog's carotid with cannulae at each end, proposed by Frank of New York, was not found practical.

These methods of direct transfusion all have possessed the shortcoming that the actual quantity of blood passing over from donor to recipient has been unmeasured. Libman and Ottenberg have recently described (*J. A. M. A.*, March 7, 1914. See this JOURNAL, May, 1914, p. 211) a method of determining this quantity. The factors in this computation are the body weights of donor and recipient and their varying hemoglobin percentages. This method, which its authors have found quite satisfactory, is not always applicable and affords, at best, only an estimate, not an actual measurement.

To measure the amount of blood passing over has led back to the old, abandoned indirect transfusion, eliminating the danger of clotting merely by developing the technic. Nor has the technic required presented any very novel feature. Edward Lindeman of New York has shown that blood can be safely transferred, in fluid form, from individual to individual by as simple a procedure as aspirating it from the donor's vein into a small piston syringe and injecting it therefrom into the recipient's vein. The only instruments required are two needles and a supply of well-made graduated glass and metal piston syringes. The essential factors in the success of this syringe transfusion are: speed and dexterity of operator and assistants, rinsing each syringe after using in warm saline solution, and maintaining a practically continuous flow through both needles of either blood or salt solution. This method not only provides at once exact measurement of the blood injected but also obviates the exposure and dissection of any vessels and the scar-

Surgical Sociology

Ira S. Wile, M. D., Department Editor.

UNEMPLOYMENT AND DISPENSARY SERVICE.

The problem of dispensary and hospital exploitation is frequently presented as dependent upon the inherent weakness of individuals desiring to get something for nothing. While it is undoubtedly true that a very small percentage of dispensary patients can afford to pay for the services secured, it must also be recognized that the vast majority of human beings are desirous of being self-supporting and independent of charities of all kinds.

The economic bases of dispensary service are complex. Few of them have been carefully studied; and still fewer are understood. The relation of industrial occupation to dispensary service deserves investigation. At the present time, serious thought is being given to the general problems of unemployment, the reason for its existence, the methods of its prevention, and the plans that may be devised to lessen its hardships. Minimum wage laws, decreasing the hours of labor, changing seasonal employments into all-year-round occupations, industrial reorganization, and unemployment insurance suggest lines of activity that are being followed, in order to demonstrate that public responsibility is being felt for unemployment and society is anxious to eliminate the existent burdens of this social oppression.

According to the United States Census for 1900, nearly 25 per cent of the working people of this country had been unemployed sometime during the year; 3,177,753 workers lost from one to three months' work each, representing on the basis of ten dollars a week, a wage loss of \$200,000,000; 2,554,925 were unemployed from four to six months of the year with a wage loss of approximately \$500,000,000; 736,286 lost work for from seven to twelve months at a loss of approximately \$300,000,000.

While census statistics are not accurate, they are very suggestive approximations gathered as carefully as may be possible. The loss of one billion dollars in wages is more than a mere financial loss, it is a social loss which is thrown upon the community. Irregularity of employment is a serious problem of industrial organization and its effects are manifest in every phase of human endeavor. Vagrancy, immorality, crime, riot, disease, impoverishment, under-nourishment, discontent, anemia, neurasthenia, desertion, suicide are some of the indiscriminate results.

The relation of dispensary and hospital service to this large unemployed portion of a community is of the utmost importance. Unemployment is a monumental cause of institutionalism. The cost of unemployment cannot be determined in figures, but it is fair to assume, that a large proportion of the general expenditures for hospital and dispensary

services must be accredited to the general social effects of unemployment. Times of unemployment are periods of temptation to crimes of trespass, particularly hazardous as indicated by the disability rate among the vagrant type. Vagrancy, however, must not be regarded as synonymous with unemployment. The true vagrant is generally a defective while the unemployed man is forced through economic conditions into his abnormal life. Enforced unemployment is hazardous in the extreme to himself, involving the moral deterioration of his family and its health, and encompassing tremendous social losses which are reflected in the growth of institutions. The solution of the problems of unemployment will undoubtedly be attended by a decrease in a number of hospitals and dispensaries and an increase in the development of medical activity for private physicians.

Book Reviews

Surgery: Its Principles and Practice. For Students and Practitioners. By ASTLEY PASTON COOPER ASHURST, A.B., M.D., F.A.C.S., Instructor in Surgery in the University of Pennsylvania; Associate Surgeon to the Episcopal Hospital; Assistant Surgeon to the Philadelphia Orthopedic Hospital and Infirmary for Nervous Diseases. Large octavo; 1,141 pages; seven colored plates and 1,032 illustrations. Philadelphia and New York: LEA AND FEBIGER, 1914. Cloth, \$6.00, net.

It is an herculean effort to encompass the principles and practice of modern surgery within a single volume, and, if Ashurst has not met with the full measure of success, he is in the class of many others who have made the attempt and have failed. Indeed, the reviewer knows of no altogether satisfying single volume text-book of surgery. It should be placed to Ashurst's credit, however, that he has more nearly succeeded than most who have tried. Throughout his work one finds evident sincerity of purpose and studious application to the task. What then are the shortcomings of his book?

A picaresque quality would be found in criticism directed at small, debatable points, and the reviewer wishes to avoid this quality. Frankly stated, therefore, the book, coming from the pen of a man who wrote that admirable and well-planned monograph on "Fractures of the Lower End of the Humerus" is found poorly balanced, and altogether too superficial. The serious student will find many important questions only partly answered. The practitioner, for whom the work is in part meant, will find it complete in some places, very incomplete and rather puerile in others. If Ashurst had only adhered systematically to a plan he evidently had—a large surgical monograph—the work would have been far more successful. But the irregular infusion of the author's opinions throughout the book robs the work of the possibility of a straightforward text-book and yet does not give it the quality of a monograph. Many statements are merely made by Ashurst which, had they been placed in a monograph, he would surely have justified by some proof. The reviewer has notes of many, of which the following may serve as examples: "I do not think much of strychnine except as tonic." (p. 44.) "Usually it is easy to differentiate clinically between sapremia and toxemia because in the former case there always is some dead and decaying tissue present where the putrefactive bacteria multiply. If this material is removed, the bacteria are removed with it, absorption ceases, and health is restored." (p. 15.) "The V. Pirquet reaction appears to indicate the existence of latent or healed tuberculosis (very rare in children) quite

Acute endocarditis is briefly described; it cannot be said that the author does justice to the subject of subacute endocarditis of the bacterial type.

The discussion of chronic valvular disease, while not presenting any new viewpoints, is amply descriptive and complete. The text-book style is discarded, and case histories are introduced liberally; this adds interest to the reading of the text. The case histories, however, are entirely too complete and occupy altogether too much space.

There are few criticisms to be brought against the book. Literary references are scant. The work is the reflection of the author and of his views throughout.

The subject of treatment is not complete; the particular favorite prescriptions of the author being again and again reiterated, nor is anything added to the subject of digitalis therapy out of the large experience of the writer. The subject of orthodiagraphy is conspicuous by its absence.

The book will serve a valuable purpose in presenting in interesting form the newer ideas on cardiac pathology, physiology and symptomatology.

A Handbook for the Post-Mortem Room. By ALEXANDER G. GIBSON, D.M. (Oxford), F.R.C.D. (London), University Demonstrator in Pathology, Oxford, and Honorary Assistant Pathologist to the Radcliffe Infirmary, Oxford. Duodecimo; 140 pages. London: HENRY FROWDE, Oxford University Press; HODDER and STOUGHTON, 1914.

The author limits himself entirely to the proper technical performance of post-mortem examinations. The necessary instruments are described and their use indicated. The correct procedures of examination of the external surface of the body and of each individual organ are described in detail. The work ends with advice on the conduct of certain special autopsies, such as cases of drowning, medico-legal cases, etc. We have found no points for criticism, and the book can be cordially recommended for the purpose for which it is intended.

Man's Redemption of Man. A lay sermon, McEwan Hall, Edinburgh, Sunday, July 2, 1910. By SIR WM. OSLER. Duodecimo; 63 pages. New York: PAUL B. HOEBER, 1913.

In this thoroughly delightful and characteristic essay, Osler sets forth the benefits of some of the epochal discoveries in medicine—anaesthesia, antiseptics, bacteriology and immunity. As an interpreter of medicine for the lay mind, Osler has few equals, and this essay is in his best vein.

A Way of Life. An address to Yale Students, Sunday Evening, April 20, 1913. By SIR WM. OSLER. Duodecimo; 62 pages. New York: PAUL B. HOEBER, 1914.

The theme of this essay is the importance of doing well the day's work without any thought of the morrow. In the exposition of this idea, Osler brings to bear all his familiar charm of style, wealth of quotation and appositeness of illustration.

The Road to a Healthy Old Age. By THOMAS BODLEY SCOTT. Duodecimo; 104 pages. New York: PAUL B. HOEBER, 1914. Price, \$1.00.

This little volume contains four chapters which deal with the subject of arteriosclerosis and its management. The author offers many helpful suggestions, especially as regards drug therapy, and presents his subject matter in a very readable and interesting style.

Books Received.

Operative Surgery for Students and Practitioners.

By JOHN J. McGRATH, M.D., Clinical Professor of Surgery, Fordham University; Professor of Operative Surgery, New York Post-Graduate Medical School, etc. Fourth edition. Octavo; 838 pages; 364 illustrations. Philadelphia: F. A. DAVIS Co., 1913. Price \$6.00

Progress in Surgery

A Résumé of Recent Literature.

Latent Mastoiditis. WILLIAM MITHOEFER, Cincinnati, *The Lancet-Clinic*, May 9, 1914.

The author cites several cases in which inflammation of the mastoid cells existed after apparent termination of the acute inflammation of the middle ear. The drum membrane may be intact; there may or may not be a mild degree of deafness; the handle of the malleus may be ill-defined or there may be very slight bulging of the upper posterior quadrant of the drum membrane. In other cases the drum may be absolutely normal in appearance. Mastoiditis in such cases may be very easily overlooked, even when the suppuration in the cells is already far advanced. The cessation of the discharge does, therefore, not signify a cessation of the inflammatory process, for the latter may be dormant for months or years in the mastoid cells. The factors at work in the production of latent mastoiditis are, the anatomical character of the mastoid cells, the shape and position of the antrum, the variety of the infecting organism and the resistance of the patient. The indications for operation are: Pain on pressure over the mastoid with a history of a former discharging ear, with a normal tympanic membrane and a positive X-ray plate. Painful mastoid with history of a former discharging ear, the tympanic membrane showing hyperemia or slight bulging of the upper posterior quadrant with positive X-ray plate. The presence of streptococcus mucosus in the exudate, with or without pain on pressure over the mastoid. Intra cranial complications having their probable origin from the mastoid cavity.

Treatment of Severe Hemorrhages Complicating Pregnancy. (*Behandlung Bedrohlicher Blutungen in der Schwangerschaft.*) P. JUNG, Goettingen *Deutsche Medizinische Wochenschrift*, April 30, 1914.

In cases of abortion complicated by active bleeding, the uterus should be explored at the earliest opportunity, even though all the products of conception are thought to have been passed. The old-fashioned curettage is entirely out of place in this exploration—it is dangerous and ineffectual. The only instrument to be used is the finger. If the cervix is open, the technic is very simple. There are two dissenting viewpoints as to the procedure when the cervix is contracted. The one is to gradually dilate, the other is to dilate at once sitting. The author favors the latter especially when fever already exists. The uterus should be explored in all septic abortions if there is any retention of ovular elements or if there is considerable bleeding.

Hemorrhage from carcinoma or myoma complicating pregnancy is not very infrequently encountered. The latter tumor generally exists in the form of a pedicled cervical polyp. This should be tied off, especial care being devoted to the stump because there is a tendency to secondary hemorrhage. If the cervical myoma is sessile, bleeding will not stop, in the great majority of the cases, until it is shelled out. The operative procedures need not result in abortion if the uterus is not roughly manipulated. Vaginal tamponade must first be practiced for bleeding from a cancer complicating pregnancy. Further procedures depend upon the operability of the tumor. If operable, there should be no delay in performing hysterectomy. Excoelation and cauterization are indicated for inoperable tumors, and, at the termination of pregnancy, the cesarian operation.

Varices of the genitals occasionally rupture and bleed furiously during pregnancy. If possible, the vessel should be transected by a ligature. This cannot be regularly done for the varices at the clitoris and labia, so that manual compression must often be practiced. If this does not control the bleeding, the entire bundle of veins must be surrounded by ligatures. Bleeding varices in the vagina should also be controlled by ligature, whenever possible, for vaginal tamponade may readily result in abortion.

in the spinal cord. A few cases of the affection localized in the cerebellum have been reported, but only four cases of a cerebral localization have hitherto found their way into the literature. The author's case, which is described in detail, is therefore of considerable interest: A child aged thirteen months had an attack of convulsions followed by right facial weakness and tremor of the right hand. Two months previously the child had a slight discharge from the right ear and a small abscess in the neck had been opened. Examination showed a tremor of the entire right side, right facial paresis and convergent strabismus. The condition not showing any improvement, it was decided to trephine over the left Rolandic area. At operation there was no sign of extradural hemorrhage or of pus. The pia-arachnoid was swollen and edematous and brain pulsations were but feebly transmitted. On account of a sudden laceration of a blood-vessel and a sharp hemorrhage, the condition of the patient necessitated a rapid closure of the wound. The wound healed by primary union, and by the ninth day there was no longer any sign of tremor. Two ounces of clear cerebrospinal fluid were evacuated by a small incision in the scalp. Three times after this the same procedure was gone through. The child's condition improved steadily so that a year and a half after the operation he was normal in every way and there was no protrusion at the site of operation.

Cecopy by Fixation of the Cecum to the Psoas Parvus. (*Technique Opératoire de la Cécopexie [Fixation du Cecum au Tendon du Petit Psoas]*). P. DUVAL, Paris. *Revue de Chirurgie*, May 10, 1914.

Several methods have been employed for the fixation of a mobile cecum. The chief ones are: 1. Fixation to a peritoneal pocket in the lateral iliac region. 2. Attachment to the posterior paritral peritoneum. 3. Fixation to the peritoneum in the parieto-iliac angle. There is a considerable proportion of failures following all these methods. Duval, therefore, determined to fix the cecum to a firm and comparatively immobile structure and has had perfect results in a number of cases by employing the following technique: A large McBurney exposure is made, the musculature being incised as well as divided when necessary. After removal of the appendix the ileocecal junction is elevated and the posterior peritoneum underlying it is longitudinally incised. The psoas parvus is thereby exposed. When this muscle is absent, the inner border of the psoas magnus is employed. Several sutures are passed, taking broad grasps of the under surface of the cecum on the one hand and the musculature on the other. The only structure to be borne in mind in the dissection is the iliac artery. After the sutures are tied the two flaps of posterior peritoneum are sutured to the lateral aspects of the cecum. If cecopexy is thought necessary, this is done before cecocolostomy is practiced.

Results of Radium in Cancer. H. H. JANeway, New York. *Journal American Medical Association*, May 30, 1914.

H. H. Janeway, New York (*Journal A. M. A.*, May 30, 1914), reviews the results of treatment of cancer by radium, noting the work of Wickham, of Paris, which seems to indicate that while the influence of radium on all types of cancer is a favorable one, it does not extend to the limits of the disease in any but the most superficial forms. Wickham's works cover 1,000 cancer cases thus treated. The work of the Radium Institute of London covers 460 cases of cancer during 1912, none of which are reported as cures, though some of them may later prove to be such. Out of 101 cases of slow growing benign forms of skin cancer, 31 patients were apparently cured for the time and 41 improved. But in cancer of the rest of the body there were only 15 apparently cured. The results also confirm the observations of Wickham. The less extensive test of radium in cancer at Vienna led to the same general conclusions. While Wickham's reports show some enthusiasm, the German reports are very conservative and the London Radium Institute is non-committal. All, however, show a remarkable agree-

ment as regards results. While radium will destroy cancer tissue in a dosage not affecting normal tissues, it does not cure the disease unless the cancer is quite superficial or of a very susceptible type. We may cherish a hope that greater success may be had in the future, but at present radium can only supplement the knife.

Can the Gamma-Ray of Radium be Produced Artificially in the X-Ray Tube? (*Laist sich die γ -Strahlen des Radiums Künstlich in Röntgenröhren Herstellen?*) FRIEDRICH DESSAUER, *Münchener Medizinischer Wochenschrift*, May 5, 1914.

Dessauer claims that through the recent perfection of the X-ray machines we have come in possession of the agency of an artificially produced gamma-ray which has from ten to fifteen times the power of penetration of similar rays produced in the ordinary machines; and that for practical therapeutic purposes this gamma-ray is almost identical with the gamma-ray of radium. It has the decided advantage of accessibility owing to its greater cheapness and also in its universal applicability.

Multiple Subcutaneous Tuberculosis Following Circumcision and Treated by Tuberculin. S. T. CHAMPTALUP, New Zealand. *British Medical Journal*, April 11, 1914.

Shortly after circumcision done in the seventh week, the child developed many subcutaneous abscesses which did not heal after incision. Both iliac glands also had suppurated. Examination of the pus showed tubercle bacilli. When the child came under observation, ten months later, emaciation was profound. The entire body was the seat of numerous superficial abscess and scars, and the child appeared hectic. Promptly after the administration of tuberculin, the wounds healed, the child improved, and at present is in perfect health. It developed later that the physician who performed the circumcision was suffering from laryngeal tuberculosis.

Hyperneurotisation, Muscular Neurotisation, Free Muscle Transplantation. Experimental Studies. (*Hyperneurotization; Muskuläre Neurotization; freie Muskeltransplantation.*) P. ERLACHER, Gray, *Zentralblatt für Chirurgie*, April 11, 1914.

Erlacher reports a series of animal experiments which suggest many practical possibilities. The motor nerve of the biceps was divided and transplanted into another site. The functional result was perfect. The ulnar or median nerve was divided and the end was transplanted into the biceps. At the end of a few weeks electrical reactions showed that regeneration was complete. Erlacher also performed a long series of experiments in which portions of muscle were transplanted into other muscles. In some instances the transplantation was free; in others the transplantation was through a pedicle. The transplants were inserted both in normal and in artificially paralyzed muscle. In every instance the transplanted muscle healed in situ and retained its function. The application of these principles to the cure or alleviation of various forms of paralysis is obvious.

Experiences With Spinal Anesthesia in Pelvic Surgery. B. M. ANSPACH, Philadelphia. *American Journal of Obstetrics*, May, 1914.

From an experience in seventy-two cases, Anspach concludes that even in expert hands, spinal anesthesia will have a higher mortality as a routine than ether, chloroform or nitrous oxide, although it has no post-operative mortality or morbidity in which respect it is superior to the ether, chloroform or infiltration anesthesia, but is not superior to nitrous oxide and oxygen in this respect. It is more troublesome to the surgeon than the inhalation anesthetics. It should be used only after the surgeon has familiarized himself with all the details of the technique; he should also be cognizant of possible complications and how to meet them instantly. Well given, it is the best form of anesthesia in selected cases, and should be resumed for those operations in which the dangers of general anesthesia are increased or in which local anesthesia or nitrous oxide and oxygen are unsuitable or satisfactory.

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Math 101

I thought that perhaps it would be well to make the subject of this talk the "Incision, Dissection, and Progress," Made in certain operations at the City Primary Surgery, in the "Theater of the Clinique," Surgical Department, and I proposed to do so in the last new lecture. At the same time, I thought that, in connection with the subject, I should say a few words on the very early stages of the disease, and on the complete emulsification of the tumor, which may be removed as far back as possible, but, in the testicle, and scrotum on both sides, and the glands of the groin. Results have shown that this is not a very important unnecessary.

noma. One in five of the cases that come to be treated for hypertrophied prostate is carcinoma. So you see that it is a very common condition, far more so than has been appreciated by the profession. It is one, however, in which an early diagnosis can often be made.

A study of our cases, however, shows that one cannot depend upon symptoms to make the diagnosis. For instance, the text-books say that hematuria is a very common symptom. That is not true. It is more common in hypertrophy. Pain, also, while more common in cancer than in hypertrophy, does not, as a rule, come until late in the disease. Our hope comes from early diagnosis, and our only prospect for that is to include rectal palpation in every physical examination. Osler used to say that no man can be entrusted to make medical diagnoses who cannot interpret a rectal palpation. The most important point in early diagnosis is induration. I wish to lay great stress on the presence of induration in the prostate, as examined by the rectum. The patient may have no obstruction, but where it is not an evident case of old gonorrheal prostatitis—that can generally be recognized or excluded—the presence of induration should be viewed with suspicion. Then, too, the induration in carcinoma is entirely different from that in gonorrheal prostatitis. It is more stony; far harder; often has an irregular edge, and does not occupy the whole prostate at first, although it may do so later.

Our pathological studies have shown that if we are going to hope for a radical cure of carcinoma we have to employ a radical procedure that includes all of the tissues that are progressively invaded by the carcinoma—the whole of the prostate, with its capsule, its urethra, a cuff of the bladder, including most of the trigone and the seminal vesicles and the ampullae of the vasa deferentia. This disease does not often travel into the bladder, but into the region between the seminal vesicles, and the very strong posterior recto-vesical fascia prevents its getting into the rectum, so that rectal involvement in carcinoma of the prostate is rare and then occurs very late. In over 200 cases I have seen it only three or four times.

The operation, which is not very difficult, follows the technic of my perineal prostatectomy until the prostate is drawn down and exposed. If you are uncertain as to malignancy, it is sometimes possible by palpation to make certain. If after that you are still uncertain, it is a very easy matter to remove a piece of the prostate with a Paquelin cautery and have a frozen section made and stained, and make a diagnosis while the operation is halted. In

a recent case where a diagnosis of probable carcinoma of the prostate was made, it contained only one nodule. I was quite uncertain, and thought it advisable to excise a piece. Microscopic examination of the section showed carcinoma, and we then carried out the rest of the operation, viz., transverse division of the membranous urethra, freeing of the anterior and lateral surfaces by blunt dissection, incision into bladder just above juncture with prostate, separation with scissors of bladder from prostate leaving a cuff of bladder attached to prostate and dividing the trigone just below the ureters, freeing the seminal vesicles by blunt dissection, division of the vasa deferentia as high as possible and removal thus of the entire prostate with seminal vesicles and cuff of bladder in one piece. The operation is completed by anastomosing the open wound of the bladder with the stump of the membranous urethra, and draining the bladder with a catheter.

It is not a difficult operation. The incision is the same as for an ordinary prostatectomy, except that the skin incisions should be a little longer, and the levator ani muscles are not divided.

We had an interesting discussion on cancer of the prostate at the International Congress in London this summer, and about twenty cases in which this operation was carried out were reported by various surgeons. I can now collect about thirty cases with a fairly large per cent. of apparent cures—several followed over five years.

There is no doubt that a cure can only be obtained by a radical operation, and no operation can be radical unless it includes the area I have described—the whole prostate, the cuff of the bladder, the seminal vesicles, and ampullae of the vasa deferentia, removed in one piece as shown.

To repeat: Early diagnosis is the important thing, and we should remember that rectal examinations should be made part of the clinical study of every medical case, and we should always be suspicious of induration in the prostate, even though it be of limited extent, and the patient may not have any symptoms which make us suspect the presence of cancer.

Through the same inverted U perineal incision—going back of the triangular ligament—it is possible not only to operate for benign hypertrophy and malignant involvement, but also to *expose the seminal vesicles* without opening the urethra. For this purpose I employ a long slender prostate tractor which can be passed through the meatus, thus avoiding the incision into the membranous urethra. By using this instrument, as a lever (the triangular ligament

volved, and an important fact is that the patient does not usually feel any pain if it is directed toward the tumor, but if directed toward the bladder, pain is experienced at once by the patient. In this very simple way it is possible to know when you are on the tumor and when not.

To show how very effective the high frequency spark can be, I had a case where the left half of the bladder was covered with tumor masses, seven in all, and each as big as a hen's egg, and the case looked absolutely hopeless. Radical operation was out of the question. That man, after various treatments over a period of six months, has been well for a year. The half of his bladder which was so extensively involved now appears absolutely normal.

It is very important to know whether you have a benign or a malignant case. Cystoscopically you cannot be sure by simple observation alone, so it is very important to get specimens for microscopic diagnosis. By means of an instrument which we have now (cystoscopic rongeur), you can remove a large portion of the tumor for microscopic diagnosis, and perform the radical operation if it proves malignant. In doing suprapubic work in these cases it is very essential that you take every care to avoid implantations. It is very easy to knock off a small particle which can drop into the wound. You should also avoid traumatism from retractors. It is important to have a wide opening; to have the bladder filled with air; to have the urine drawn out by a suction apparatus so as not to break off or wash away any villi, and if possible to cauterize the surface of the tumor, before you start on the resection, with Paquelin or electro cautery applied over the surface, or by the use of resorcin. Your excision should include the whole bladder wall. We followed very carefully the subsequent course of our cases and find a good number of cases treated by resection of the bladder wall without recurrences, while the cases treated by clamping the pedicle and excising beneath it close to the bladder have almost all recurred.

A very important thing is to be suspicious of all cases of hematuria. It may come from a slight prostatic enlargement; it may come from a varicose vein in the bladder, but it is important that all these cases should be diagnosed early, and as hematuria and pain are often early symptoms it is very essential that early cystoscopic examinations should be made when it is usually so easy to make the diagnosis in this way.

The same is true of *tumors of the kidney*. As you know, they are usually associated with hematuria, often with no other symptom; occasionally with

colicky pains; sometimes on the side opposite to the one involved, but often none at all, only hematuria. These cases should be investigated early. Tuberculin tests will eliminate or establish tuberculosis. Ureteral catheterization and the use of the new functional tests are valuable in comparing the kidneys. The phenolsulphonephthalein test is especially valuable and ought to replace many of the present methods. It is one of the best means of determining when a patient can be given an anesthetic with safety. It shows the functional value of the kidneys, and it ought to be generally adopted, for it is simple and effective.

The pyelograph, which usually shows marked distortion of the renal pelvis in tumor cases, is of great diagnostic value, but collargol must be used very carefully and allowed to flow in by gravity.

If by these methods, which may be called laboratory methods, but which can be easily carried out by most practitioners, the early diagnosis of kidney lesions is much facilitated, and we may look forward to better results. Heretofore the results obtained in renal tumors have been rather bad, and the tumors have usually recurred. I think that often pressure upon the tumor is made too violently during operation, resulting, I believe, in forcing metastases producing material into the circulation. This should be avoided, and one should get a wide exposure and divide the pedicle as soon as possible. The possibility of doing this early is the principal advantage of the intraperitoneal operation for renal tumors.

In *stricture of the urethra* much advance has been made. A few years ago external or internal urethrotomy were generally thought to be necessary, and in the teaching of Otis most cases were so treated. With a French filiform bougie and dilating follower, it is possible to get through almost any stricture, and generally to cure them without any operation except progressive dilatation. It is very essential that the kit of every surgeon should contain these delicate instruments. Many a man who has stricture with complete retention of urine can be easily relieved without operation if you have a fine filiform and a soft catheter which can be attached to it.

Another recent development in surgery is in the treatment of *stricture at the vesical orifice of the urethra*; that is, in the prostatic portion. Until a very few years ago it was thought that stricture of the prostatic urethra did not occur. It is true you do not often find it in hypertrophy, but in chronic prostatitis you will frequently find a narrowing of the prostatic orifice, which has been described by

occurrence of the general signs of infection which was found to be slight and did not interfere with a smooth recovery. Operation with drainage on the third, fourth, and fifth days give as good results as immediate operation. I do not wish to be understood as advising against early operation in all cases, but only in cases of moderate severity which in my experience form a large majority of cases. Of course, when there are signs of rupture of the overlying peritoneum, of other abdominal injury, of a severe rupture or profuse or continued hematuria, early operation is essential.

Moreover, when the kidney is exposed and a moderate rupture found, suture of the tear, including the capsule, should be made and not nephrectomy, for remarkable repair of renal tissue is shown to occur by experiment and clinical observation, and wounds of the kidney heal more readily if the capsule is sutured.

Bullet wounds of the kidney differ from traumatic rupture by reason of the fact that the peritoneum is far more often involved in the lesion due to a bullet; in fact, it is the rule.

In bullet wounds of the kidney it is important to drain the track of the bullet through the kidney as well as the perirenal tissue through a lumbar opening. In most cases abdominal exploration is essential to find and treat wounds of other organs and of the overlying peritoneum. If possible the anterior opening of the kidney should be closed by a purse-string suture or at least the opening of the peritoneum in front. In a recent case drainage of the tract and the retroperitoneal tissue proved sufficient. In this case there were three bullet wounds, one perforating the kidney, there were two holes through the diaphragm and pleural cavity, the spleen was grooved, and the stomach grazed by the bullets. The patient recovered. In another case of multiple wounds of the intestines and liver, imperfect drainage of a wound of the kidney led to a fatal result.

It seems strange that an early or an earlier diagnosis of renal tuberculosis should not be made than appears to be the case from the time when these cases are referred to the surgeon. The importance of this lies in the fact that the proportion of those who are well or much improved after nephrectomy is far greater in the early cases than in those where the symptoms have existed more than one or two years.

Diurnal irritability of the bladder, with moderate pyuria and slight hematuria with an acid urine, should at once suggest renal tuberculosis. By diurnal irritability we do not mean that there is no nocturnal, but only to distinguish it from prostate

trouble in which the irritability is nocturnal. There are many cases of diurnal irritability without pyuria, especially in women, which are not tuberculous in origin and appear to be a form of neurosis. Other cases are due to some form of cystitis. Given the above form or diurnal irritability, tuberculosis should be looked for, as it can be found in practically every case by repeated examinations. If not found, guinea pig inoculation has proved positive in one or two cases in my experience, but it takes time. A cystoscopic examination should always be made, as a tuberculous bladder is usually recognized by a competent cystoscopist and this also leads to the *localization* of the process which is most important and sometimes most difficult. What we expect of the cystoscopist is to determine: (1) whether the bladder condition is secondary to the kidney or the prostate or epididymis; (2) whether one or both kidneys are involved; (3) which kidney is diseased; and (4) the function of the other kidney. A recent experience demonstrates the occasional difficulty of this localization and shows how much we have come to depend on the cystoscopist.

A young man of seventeen was referred to me last spring with all the above symptoms of renal tuberculosis with very numerous bacilli in the urine. On cystoscopy the bladder was found in an unusually advanced stage of tuberculosis. It was impossible to catheterize either ureter, and both ureter mouths appeared markedly diseased. The bladder was treated for some weeks with iodoform in olive oil and gomenol, with some relief to the patient, but no change in the result of the secondary cystoscopy. Bilateral renal tuberculosis was suspected, but as an only hope both kidneys were exposed, the left was found healthy, the right markedly diseased, and was removed. He made a good recovery, but subsequently died of tuberculous meningitis.

Given the diagnosis and the localization of the lesion in one kidney, the treatment should be simple, *i.e.* nephrectomy, provided the other kidney is healthy or at least functionally so. The frequent and often fatal delay in recommending operation appears to be due to the false impression prevalent that renal tuberculosis may be cured by other means than surgical, *i.e.* climate or the use of tuberculin. Tuberculin is a waste of time and according to Israel should not be used even in the very earliest stage. Climatic treatment gives an enormous mortality. Out of seventy-one cases at the Mayo clinic not operated upon, forty-eight were traced and only three were free from bacilli and vesical symptoms. Out of 316 cases treated in Switzerland non-surgically and collected by Wildholz, only ten per cent.

which are usually explained by the fact that stones of pure uric acid fail to show a shadow. My own feeling is that there are many more cases of renal calculus that fail to give an x-ray shadow and are therefore refused operation. Especially in hospital practice I have seen several cases in which the history, symptoms, and signs point strongly to renal or ureteral calculus. Usually there have been several attacks at varying intervals. Perhaps every typical symptom is not present, but the great majority are, and the x-ray is negative. Bacteriological examination of the urine is negative, excluding pyelitis. We usually refuse to operate on these cases, but tell them to return if they have another attack. Some of them, I presume, have calculus, but in the absence of severe, long-continued, and disabling attacks, or of infection of the affected kidney, it is better to delay and observe them than to operate perhaps unnecessarily.

With the addition of so many outside aids to diagnosis we are apt to neglect the importance of the clinical diagnosis. For some it is all there is to depend on; for others it is safer than the available laboratory methods; and for all it is of the highest importance and may save us from unpleasant mistakes. The most common of these mistakes concerns the differential diagnosis between appendicitis and renal or ureteral calculi. One such case, where the x-ray failed but the clinical diagnosis seemed and proved to be certain, has been referred to. Like most surgeons I have removed calculi in patients who had had the appendix removed for the same symptoms; and, on the other hand, I have removed the appendix when the real trouble was calculus, and have learned from both experiences to be more careful in the different diagnoses. When the history, symptoms, and signs are not typical of appendicitis, it is well to have an x-ray to exclude a possible urinary calculus. There is no one symptom or group of symptoms that will clearly differentiate one from the other. Frequent micturition and hematuria, often a microscopic hematuria, are characteristic of calculus, but have been observed in some cases of appendicitis, especially in very acute cases, less often in the subacute ones that are more often difficult to differentiate from calculus. The pain or "colic" in the calculus is usually more sudden in onset, intense and intermittent, but some cases of true appendicitis simulate calculus in the severity of and colicky character of the pain. On the other hand, inflammatory symptoms, rise of temperature, pulse, and the leucocyte count are the rule in appendicitis, but do not occur in calculus disease until later, from the occurrence of infection.

However, any one or all may exceptionally be wanting in an acute or subacute appendicitis. Nausea may occur in both conditions, but vomiting more often with appendicitis; the absence of vomiting, however, does not exclude appendicitis. Tenderness occurs with both, while rigidity is characteristic of appendicitis, but may occur during the paroxysms of renal or ureteral colic. Between the attacks of colic, a patient with calculus may be quite comfortable and does not look so ill (unless worn out by loss of sleep), as a patient with acute appendicitis. The peculiar radiation of the pain to the tests, penis, vulva, thighs, etc., may distinguish a case of calculus, but is by no means usually present. Given a suspicion of urinary calculus or a doubt as to appendicitis, an x-ray should be taken to help the differentiation.

In operations for renal calculus, with infection of the kidney, the question often arises shall we do a nephrectomy or a nephrolithotomy with drainage. If there is no contraindication, nephrectomy will lead to a surer and speedier cure. But nephrolithiasis, especially in these old chronic cases, is often bilateral, so that before doing nephrectomy we must make sure that the other kidney is free from stones and infection. In one such case I found the kidney in question was the best of the two, by means of ureteral catheterization and urinalysis of the separate urines. I was surprised in this case to see how well the patient did with two damaged shells of kidney tissue. Though she required many operations from time to time, she lived seven years and most of this time was well enough to do the housework for her large family. Though only a shell of kidney tissue is present, it may sometimes be worth saving. The principal drawback in such cases is the likelihood of recurring lumbar fistulae, sometimes open and sometimes closed.

In the removal of renal calculi I prefer to do a pyelotomy rather than a nephrotomy if the stone is in the pelvis. Mayo has emphasized the fact that if we leave and suture the overlying fat, the wound of the pelvis heals readily. Though I have never had serious hemorrhage from a longitudinal incision of the kidney, I have recently used the transverse incision of the kidney where the stone could not be reached by a pyelotomy, as such an incision often damages less kidney tissue than the longitudinal incisions.

If a frightened or refractory child will not open its mouth, pass a probe between two teeth and back to the palate. Instantly the mouth will open and a gag may be slipped in.

after the contrast meal in the lowest part of the ileum a narrowing of the bismuth shadow corresponding to a tumor that could be felt at that place. The afferent loops were tightly filled and the colon showed the usual shadows. When the operation was performed, a cancer of the ileocecal valve was found. But in the case published by Wendel,³ the diagnosis does not seem to me justified by the x-ray finding of several intestinal loops separated from each other by short inter-walls, though the operation confirmed the diagnosis of several tuberculous strictures.

In the same way, retention of the contrast meal is alone no proof of a stricture. As a rule, a normal stomach and a normal small intestine will be free of bismuth shadow six hours after the contrast meal. But in cases of enteroptosis, Schwarz⁴ found even after nine hours the lowest loops of the ileum still filled with bismuth chyme; in cases of so-called insufficiency of the ileocecal valve the emptying of the small intestine may also be delayed. This retention may be due, as Groedel⁵ surmises, to the flowing back of cecal contents in the ileum. Bacher therefore had no right to diagnose a stricture of the ileum in a case where he found a retention after six hours. We also must not forget that a stenosis of the colon may in certain cases be the reason for a retention in the small intestine. An error like that can easily be avoided by using the contrast enema which will show the obstruction of the colon.

Neither the irregularity of the contours nor the retention of the chyme allow the diagnosis of a stricture if there is no other symptom that is characteristic of a stenosis, such as a change of the peristaltic movements like that we have already described for the duodenum, and called ineffective peristaltic contractions. Levy Dorn⁶ and Stierlin⁷ observed this kind of peristalsis in cases of stricture of the ileum, due to tuberculous callosities, and Novack⁸ found it in a case of multiple strictures of the small intestine, also due to tuberculosis, and in another case where several fibrous bands, due to a previous peritonitis, had caused multiple strictures of the ileum and jejunum.

This ineffectual peristalsis is certainly a typical

sign of stricture of the intestine, but it is not an indispensable one. Indeed, just as in cases of stenosis of the stomach, here, too, the period of increased peristalsis in the beginning is followed by a period of diminished movements. The muscular fibers become fatigued and relax; the intestinal loop, unable to expel its contents, dilates. The first sign of the dilatation of the intestinal loop is that it appears on the radiograph to be more straight instead of coiled, it is broader than usual, and the indentations due to the folds of Kerkring are more distinct. Schwarz⁹ found in a case of tuberculous stricture of the ileum, eight hours after the contrast meal, shadowy bands in the form of festoons stretching from the right to the left spine ilica anterior superior and sinking in the middle to the symphysis. In a case of multiple tuberculous strictures, Stierlin¹⁰ saw dilated loops in several places deeply indented, and after twenty-four hours the loops were still to be found. The same symptom is described by Hinz¹¹ in a case of cancer of the jejunum; below the shadow of the stomach and confluent with it, he found a big broad shadow that continued to the left as a shadow ten centimeters broad and as big as a child's arm and corresponding to the beginning of the jejunum.

If the stricture is narrow and persists long enough, this dilatation of the afferent loop increases. Decomposition develops in the retained intestinal contents so that the loop expands into an ampuaceous hollow space filled with chyme and gases. The x-ray photograph lets us discover one or more loops dilated like a ball; in the lower part of it we find a dark bismuth shadow and above a gas bubble. The limit between the gas and the bismuth is always a horizontal line whatever position we give to the abdomen, so that evidently the contents of the ampulla are liquid. Schwarz⁴ saw in a case of cancer of the ileum, eight hours after the contrast meal, one big and two smaller balls filled half with liquid bismuth, half with gases; in another case he could observe the retention even after seventy-two hours; the stricture was this time due to metastases of a cancer that caused a kink of the intestine. Czyhlarz and Selka¹² and Schmidt¹³ observed, each in a case of tuberculous stricture, twenty-four hours after the contrast meal those same ampullas filled with gas and chyme. Re-

³ Wendel—Multiple Stricturen des Dünndarms. Med. Gesellschaft, Magdeburg. 7. XI., 1912. Münchener Medizin. Wochenschrift, 1913/6.

⁴ Schwarz—Die Erkennung der tieferen Dünndarmstenosen mittels des Röntgenverfahrens. Wiener Klinische Wochenschrift, 1911/40.

⁵ Groedel—Die Insuffizienz der Valvula ileocecalis im Röntgenbild. Fortschritte auf dem Gebiet der Röntgenstrahlen. XX., 2.

⁶ Levy Dorn—Verhandlungen der Deutschen Röntgengesellschaft, 1911.

⁷ Stierlin—Die Radiologie in der Diagnostik der Ileocecaltuberculose und anderer Erkrankungen des Dickdarms. Münchener Med. Wochenschrift, 1911/23.

⁸ Novack—Zur radiologischen Diagnose der Dünndarmverengung. Wiener Klin. Wochenschrift, 1911/52.

⁹ Zur Röntgendiagnose der Dünn- und Dickdarmstenosen. Verhandlungen der Deutschen Röntgengesellschaft, 1912 und 1. c.

¹⁰ Stierlin—Zur Röntgendiagnose der Dünndarmstenose und des Dünndarmleits. Medizin. Klinik, 1913, 8, 983.

¹¹ Über den primären Dünndarmkrebs. Archiv. für Klin. Chirurgie. Bd. 99.

¹² Czyhlarz und Selka—Beitrag zur radiologischen Diagnostik der Dünn-Dickdarmstenosen. Wiener Klin. Wochenschrift, 1912/9.

¹³ Schmidt—Benignationen über Dünndarmstenosen. Münchener Med. Wochenschrift, 1913/17.

narrows the intestinal lumen, or be it adhesions or a tumor that compress the loop from the outside. The various pictures we get of the intestinal stricture do not correspond to a specific kind of stenosis, but only to the degree and the duration of the stricture.

X-ray examinations are equally unsatisfactory as to the seat of the stricture; here, too, the duodenum, the beginning of the jejunum, and the lowest loop of the ileum form an exception, because of the neighborhood of the stomach and the colon, respectively, which indicate the site of the lesion. But the strictures of the middle loops cannot be localized on the x-ray plate. It is impossible to judge by the appearances at what short distance the stricture is from the duodeno-jejunal plica, and at different examinations the strictured loop may even have different positions. That is the reason why David¹⁵ invented his probe, analogous to the duodenal probe; it is gradually advanced until it reaches the stricture and then a contrast liquid is instilled. By that method we can easily find out the distance of any stricture from the range of the teeth. But to my thinking, we are not made much wiser by it. A stricture of the small intestine has to be operated upon. The place where the strictured loop is to be found often reveals itself to the surgeon by the fact that a tumor is to be felt or stiffened loops are to be seen. And if the clinical observations do not show us the seat of the strictured loop, we learn nothing by knowing the distance of the stenosis from the teeth; we must open the abdomen and the dilated loops will then show us where to find the stricture.

But the method may prove helpful for making out the nature of the stenosis, and we will certainly often be able to discriminate between intestinal obstructions due to adhesions and those due to ulcerous affections. But I doubt if we may distinguish between a cancer and a circular tuberculous ulcer. For this, however, there is no need, since they alike require surgical attack.

Summary: The x-rays are an excellent aid in the diagnosis of strictures of the small intestine. The characteristic signs of a stenosis are:

1. Irregularities of the contours of the bismuth shadows.
2. Retention in the small intestine far longer than the normal time.
3. Strong but ineffectual peristaltic contractions.
4. Dilatation of the afferent loops; in the first period the loops are broader and straighter than usual; later on they are transformed into ampulla-

ceous hollow spaces filled with liquid and gaseous contents. Sometimes these ampullae are to be seen without a contrast meal.

Not all of those signs are needed to establish diagnosis. Irregularity of the contours or retention alone do not allow the diagnosis of a stricture. Lack of peristalsis does not speak against a stenosis.

If the stricture belongs to the duodenum, the beginning of the jejunum, or the lowest loops of the ileum, the x-rays enable us to localize the seat of the narrowed parts and sometimes even to recognize the nature of the stenosis.

STRAIGHT DIRECT LARYNGOSCOPY, BRONCHOSCOPY AND ESOPHAGOSCOPY.

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(Continued from July Number.)

UPPER TRACHEO-BRONCHOSCOPY.

That the upper operation is more difficult than the lower is evident from the fact that the larynx has to be passed. For this reason, one, to become an expert bronchoscopist, must have a good working knowledge of direct laryngoscopy. In an emergency one who is not particularly skilled in direct laryngoscopy may succeed in getting a tube into the trachea, but his movements will be uncertain and fraught with danger to the patient. If, during the attempted examination, strangers are present, the awkward and hesitating movements of the operator will be noticed to his discredit and embarrassment. In no branch of medicine is lack of experience or ignorance so quickly noticed. Unlike direct laryngoscopy tracheo-bronchoscopy is difficult to learn to do well. While any laryngologist can learn direct laryngoscopy in a few lessons, passing a long tube into the trachea in the proper way is a difficult procedure. There are many problems to overcome before one can call himself a finished operator. Some few men never succeed in passing the bronchoscope because they are not fitted by temperament to do such work. On two different occasions the writer heard expert laryngologists say they could not do bronchoscopy because they did not have the patience. It is undoubtedly true that some men are born with a certain manual dexterity which stands them in good stead in passing tubes. To all laryngologists who would do tracheo-bron-

¹⁵ David. Zur Roentgendurchleuchtung des Dünndarms. *Verein der Aerzte in Halle*, 21. May, 1913. *Munch. Med. Woch.*, 1913, 32.

of the bronchus to locate the secondary bronchus going to the upper lobe. Since there are only two lobes on the left, the opening of the secondary bronchus is always situated lower down than on the right side, and to be seen clearly the head must be carried still further to the right. It can be examined about as well as the opening of the opposite side. The distance between this opening and the terminal bronchi is short and the latter present the same general appearance as on the right side. Because of the difference of the angles of deviation of the two bronchi, foreign bodies are more apt to lodge in the right than the left bronchus; some very curious cases of foreign bodies in the left main and terminal bronchi, however, have been reported. All the foreign bodies seen by the writer have been in the right bronchus. In looking for foreign bodies, not possible of location by the x-ray, one should not be satisfied until every portion of the bronchial tree has been examined. In using Jackson's in-

nstruments be completed as quickly as possible. It is a peculiarity common to every kind of direct examination that its difficulties vary to a great extent with each case, and this is more especially the case in direct tracheo-bronchoscopy. Whereas, on the one hand, a brief diagnostic glance in the case of a patient in the sitting position, who is particularly tolerant and easy of examination, presents one of the easiest problems; on the other hand, the treatment of a case of a chronic foreign body may make such extensive and varied demands on the operator as perhaps occur in no other surgical operation. In such a case it is necessary to be cautious and to keep within permissible limits while proceeding without hesitation. It is a question of combining the application of force with manipulative skill of an unusual kind, and of controlling the behavior of the patient and of the technical apparatus with equal certainty. If, besides this, the haste required and the danger which may result from a moment's



Fig. 1. Introduction: Stages I. and II. Brunings.



Fig. 2. Introduction: Stages III. and IV. Brunings.

struments the object of the double battery is seen in the introduction of the bronchoscope where one can light the laryngoscope and the bronchoscope at the same time. As the writer does not use the separable speculum for passing the bronchoscope, he no longer needs the double battery, but for the beginner it is indispensable. As stated above, if one prefers Brunings' instruments, he must have a more powerful source of light than a battery of dry cells.

Brunings' method. This method will be given in Brunings' own words. He says: "It has already been indicated that far greater difficulties are presented by the upper method as compared with lower tracheo-bronchoscopy. The reason of this is, in the first place, that the introduction is more complicated and the larynx has to be passed; secondly, that the tube is not only much less mobile, but at the same time longer; and, thirdly, that the patient is inevitably inconvenienced, and the examination must

delay are considered, my reason for laying stress again on the value of careful preparation will be understood. Upper bronchoscopy should be preceded by a detailed preparation carried through with pedantic thoroughness, in order that it may proceed swiftly, calmly, and without interruption. The tube should be introduced immediately after the use of cocaine, and, though hurry must be avoided, the duration of endoscopy must be reduced to a minimum, and all unnecessary repetition omitted. The necessary preparations include not only the complete mastery of the instruments, but also some practice in direct laryngoscopy and lower bronchoscopy. The practice of the upper method consists simply in combining these two, and even a beginner, if he has mastered them, may attempt the procedure with confidence. Apart from abnormal anatomical conditions, the upper method of bronchoscopy is always applicable; and fortunately it is possible, by means of those tests which were men-

easily part them without causing much inconvenience. It is only when anesthesia is incomplete that it may be necessary to insert the wedge-shaped end of the tube in a sagittal direction, in order to separate the apposed vocal cords. When there is much resistance, the passage of the tube—after it has been well greased and warmed—may be facilitated by not pushing it with the right hand, but manipulating it with short leverage movements by means of the left index finger. All friction against the teeth and the left hand is thus avoided, and the tube advances gradually without jerks."

The writer's method. The writer has worked out a simple method which is somewhat similar to Brunings' except that only one tube is used and the position of the head is different. Since the introduction of the straight method of direct laryngoscopy nearly five years ago, the writer has used

deadens the trachea sufficiently. The laryngoscope is now withdrawn and the bronchoscope rubbed with sterile vaseline. The head is held as straight as possible; in many patients it is almost perfectly straight, while in others it is slightly extended. Compared with all other methods, the head may be described as straight in every case. The patient opens his mouth, and with the eye looking through the long tube, it is passed between the left or right bicuspid teeth. It is perhaps better to use the right side of the mouth, since it is easier to enter the left bronchus from that side and there is no difficulty in getting in to the right bronchus. The bronchoscope is passed with the right hand, while the left index and middle fingers rest on the lower teeth to act as a pilot and to steady the tube in its descent. The tube slips down easily, pushing the tongue out of the way, and the epiglottis quickly



Fig. 5. Introduction in the lateral position. Brunings.

a method of tracheo-bronchoscopy which seems much simpler than other methods. The basis of the method is the straight position of the head as used in direct laryngoscopy and upper esophagoscopy which have succeeded so admirably in the hands of all who have employed them. The patient is seated on a low chair with a comfortable back; the pharynx is anesthetized with a twenty per cent. solution of alypin applied with a curved applicator. After waiting a few minutes the small laryngoscope is passed until the epiglottis comes into view. The larynx is now brushed over with alypin applied on a straight applicator through the laryngoscope. As in direct laryngoscopy the tube is passed between the left bicuspid teeth with the head straight. The epiglottis is now hooked forward and the larynx inspected. If the vocal cords are still sensitive, more alypin is applied to them and a long applicator loaded with the same drug is pushed between the cords and down to the bifurcation, which usually

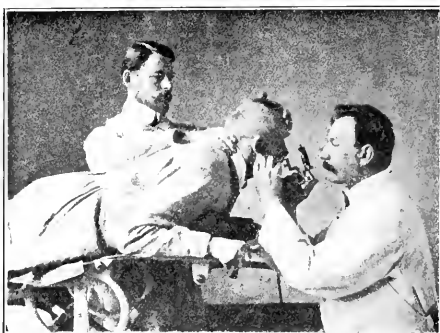


Fig. 6. Introduction in the ventral position. Brunings.

comes into view. This movement, which is simply pushing the tube straight down, may be called the first movement. The second movement consists in pushing the end of the tube backward against the wall of the pharynx and then reversing the movement to pull the epiglottis forward. When this is accomplished, the larynx comes into view and the third movement is soon finished by pushing the tube between the cords by a gentle rotary motion. It is better to turn the instrument so that the long end will insinuate itself between the cords first so that the tube will follow without difficulty. In passing the tube no account is taken of whether the cords are separated or not. The method has been described as consisting of three movements; as a matter of fact, the tube enters the trachea so quickly that the three movements seem to be only one. It takes a few seconds to get the tube into the trachea. Since the head is straight, there is no obstruction to the entrance of the bronchoscope.

tends that the cramped position of the operator and the unnatural position of the patient are not conducive to the best work. He therefore proposes to suggest another position which he believes will be easier for beginners. Jackson has become wonderfully expert with this position, but for other operators it is difficult. This position is rarely used unless the patient is to be given a general anesthetic.

Brunings' method. "Normally this is done with the patient lying on his back while an assistant supports his hanging head in such a way as entirely to relax the muscles of the neck. In this, just as in autoscopia, too much strain at the outset must absolutely be avoided, and the surgeon should perform the first stage in a more or less upright position. The position of the electroscope follows from the general rule which requires the lamp to be directed sagittally to the patient. The left hand should then resume the position in which it protects the lips and teeth and insures the medial direction of the tube. During stage II. of the autoscopic displacement, the patient's head must necessarily be lower, so that the surgeon can resume a sitting position. Here again the protection of lips and teeth must be remembered, and no advance should be made in the manner indicated until the autoscopic presentation is obtained. Introduction in the dorsal position is rendered difficult, not only because topographical relations are reversed, but because the electroscope has to be manipulated in an unaccustomed manner, and the direction of autoscopic pressure is inconvenient. It is therefore advisable, when there is an opportunity to obtain some preliminary practice in autoscopia on sitting patients, the introduction being made by the surgeon standing behind the patient's back. The phonation (sound of breathing) must be attended to, and the three stages carefully observed. When introduction in the dorsal position presents insuperable obstacles, it is usually possible to succeed in the following manner: Put the patient over on his left side, having the head supported, and then introduce exactly as in the sitting position. When the tube is in the trachea, the patient should be carefully moved on to his back, because the lateral position becomes tiring for the surgeon. I have found that this introduction in the lateral position generally succeeds fairly easily even with inexperienced operators. The lateral position appears to offer no advantages for the further pursuit of the examination; in esophagoscopy the opposite is the case, because the unaccustomed relative positions make orientation even more difficult. No doubt excep-

tions must occasionally be made—for instance, when there are objections to having the head hanging over the end of the table (in the case of elderly people), or if it is desired to facilitate the removal of bronchiectatic secretion by raising the diseased side of the lungs."

The writer never uses the supine position without general anesthesia, since he has always succeeded in examining patients in the sitting position under local anesthesia. The method to be described is practicable, however, for more than once the larynx has been examined in the supine position with head straight under local anesthesia and exactly the same position is used in passing the bronchoscope. For bronchoscopy under general anesthesia, the writer is convinced that the method is the simplest and quickest of all methods. There are two ways of passing the tube, both of which will be described. The table used is one of average height with or without a leaf that can be lowered.

Bronchoscopy with the separable speculum. The patient lies on two cushions which are just thick enough to allow the head to fall to the plane of the table when the small cushion is removed. This must be carefully regulated before the anæsthetic is administered so that no time will be lost after the operation begins. The writer has two cushions which are suitable for all patients. With the patient etherized or not, as the case may be, the operator, standing to the left of the table, passes the large or small separable speculum according as a large or small bronchoscope is to be used, between the left bicuspid teeth, hooks the epiglottis upward and exposes the larynx. The bronchoscope is then passed through the laryngoscope and the eye is transferred to the smaller tube. When the vocal cords come into view, the bronchoscope with a gentle twisting motion is slipped between them into the trachea. The long tube is now steadied by an assistant while the operator removes the separable speculum and directs that the cushion under the head be removed so that it can be lowered to the plane of the table. The operator now takes his seat at the head of the table on an ordinary stool and takes charge of the bronchoscope. It will generally be found that the head is too low and a small pillow will have to be placed under it. In this method it is not necessary to pay any attention to the shoulders, which is so important in the "Boyce position." Having adjusted the head at the proper height, the tube is pushed down easily. It will be observed that the head is only slightly extended. When the bifurcation is reached, the operator turns the head with the left hand while the right guides

the tube into the bronchus to be explored. Since the patient is asleep, there is no difficulty in changing the tube to the right side of the mouth if necessary, but usually it will be found that one can enter the two bronchi with equal ease from the left side. The writer has been surprised more than once at the slight movement of the head required to pass the tube into the bronchi. There is no necessity to move the head antero-posteriorly, since the pillow of proper thickness attends to that. While the preliminary movements may sound complicated, it requires only a few seconds to get the bronchoscope into the trachea and to push it further down. The many advantages, as seen by the writer, will



Fig. 1. Upper. The patient is lying on the table, the assistant, holding the head of the patient, extends the left hand. The position of the head is such that the tube can be introduced into the trachea.



Fig. 2. Lower. The patient is lying on the table, the assistant, holding the head of the patient, extends the left hand. The position of the head is such that the tube can be introduced into the trachea.

be pointed out under the other method of bronchoscopy.

Bronchoscopy with the patient lying on the table. The position of the patient is the same as for the first operation except that the head is slightly extended. The operator sits at the head of the table and passes the bronchoscope between the right or left bicuspid teeth; the index and middle finger of the left hand are placed between the teeth to act as a pilot. The tube is passed down until the epiglottis comes into view when the long part is depressed against the wall of the pharynx and pushed slightly downward and then upward to hook the epiglottis out of the way. The larynx is now exposed and the tube is carried between the vocal cords by the same twisting or rotating motion described above. Under general anesthesia one does not have to exercise the same care in passing

the tube into the bronchus as under local anesthesia. The only contraindications in manipulating instruments in the pharynx are: 1. This method is probably more quickly executed than the first method, but it is more difficult for the beginner, because the small tube is passed up side of the vocal cords. After the tube passes the vocal cords the position of the head is regulated as above and the examination is proceeded with. The writer has found these methods perfectly satisfactory under general anesthesia and believes they possess many advantages over other methods. To begin with, the work is simplified in that fewer assistants are needed; the only assistants absolutely necessary are an anes-

thesiologist, after the patient is asleep and the tube introduced, stands to one side and gives ether as may be needed, and a nurse to load the instruments. No assistant is needed to hold the head because throughout the procedure the head is on the table. Again the operator sits on a high stool and manipulates the instrument from a comfortable position which increases the accuracy as well as the readiness of the work. Finally, the patient is not moved while the examination is being conducted, thus obviating the risk of injury to the patient. In other methods, the patient is moved, and in the "Hayes position" of fourthly, it has seemed to the writer that the extension of the head is necessary in other methods, since it is exactly similar to the method of under local anesthesia. In older children the same methods are used. In younger children no anesthesia is used and the head must be extended slightly more to pass the bronchoscope by these methods. Jackson uses the

"Boyce position" in children as in adults. Brunings advises a special set of instruments for children and makes some statements which expert bronchoscopists in this country will not endorse. His views on endoscopy in children are so at variance with those held in this country that the writer thinks it will not be amiss to copy his chapter on this important subject. He says: "When I mentioned the use of direct laryngoscopy and tracheo-bronchoscopy in the case of small children, I did not lay any special stress on it, as I wished to detail the normal procedure as clearly and comprehensively as possible. On account of the unusual difficulties encountered in the direct examination of children, it is not only necessary to employ numerous variations of methods, but additional instruments are also very useful in certain cases. If, then, the undoubted importance that the method must assume in the hands of children's specialists is considered, no further excuse for the inclusion of this chapter is necessary. The difficulties in examining children lie, in the first place, in the relative smallness of the parts to which the endoscopic apparatus must be adapted. The diameter of the bronchoscope tube is reduced to 7.6 millimeters, and approaches the limit at which orientation or the manipulation of instruments under the guidance of the eye is possible. In addition to this the restlessness of children, their tendency to spasm and salivation, the forcible respiratory movements of the trachea and bronchi, and, above all, the increased danger of collapse owing to the use of cocaine or a general anesthetic, must be taken into account. The endoscopic treatment of children yields, however, such gratifying results that it surpasses in importance the endoscopy of adults. In this connection I need only mention the case of foreign bodies, of which far more than half occur in childhood. According to the statistics of Gottstein, which I have already referred to frequently, the series of 111 cases of foreign bodies which he treated bronchoscopically show the following age distribution:

Age (years)	0-1	1-2	2-6	6-12	12-18	18-63
Foreign bod...	6	11	35	17	6	36

Taking the percentages it is seen that the period from birth to six years embraces forty-seven per cent. of all cases; the period from birth to twelve years old, sixty-nine per cent.; whilst the entire period from twelve to sixty-three is responsible for thirty-eight per cent. The instruments contained in any normal set usually suffice for small children, but it is obvious that an instrument which is strong and big enough for the examination of grown men is not exactly the most suitable for small children.

I will therefore describe some special instruments and their degree of importance as well as the special advantages attaching to their use. For general use, the composition of a set suitable to children's requirements will be given, and the children's specialist can confine himself to these. In the mechanical construction of my broncho-electroscope, the application of force which the autoscopic displacement in adults entails must be taken into account. The special handle which I constructed with this object is neither necessary nor, in many cases, convenient for the examination of children. For lower tracheoscopy, which is so much more frequent in children, the handle is inconvenient, owing to its length and weight being relatively so much greater than that of the small tracheal funnel. The mechanism, also, whereby the lamp can be pushed to one side, is not of much use in children, as their delicate air passages do not permit of the lateral pressure bound up with this maneuver. I would advise, if the equipment is very complete, that the universal electroscope should be used for children. The lamp and projection apparatus are the same as in my broncho-electroscope, but the light handle affords more easy manipulation in those cases where the employment of force is not necessary, and where the tube must lie close to the surface of the body (tracheal fistula, etc.). The mechanism of the mirror holders is also very convenient in examining children. By pressure of the thumb it is clipped in position above the upper end of the tube, and when the pressure is removed it flies back into its original position. I have often used the instrument to great advantage in lower tracheo-bronchoscopy. A special spatula is particularly desirable in direct laryngoscopy of children, and I have devised one to meet the case. The instrument is grooved and has a somewhat broad fish-tail end, the upper half is bent round to form a kind of box, which is, however, open on the right side, so as to facilitate the introduction of instruments and their manipulation at an angle. I must further recommend the use of the five normal bronchoscopic tubes through a tube, No. 1.5, of 7.75 millimeters diameter, which is more suited to children's requirements, and is midway between No. 1 (7 millimeters), and No. 2 (8.5 millimeters). It is made of tempered steel. Exact observation in the neighborhood of a tracheotomy wound (difficult decanulation) makes necessary the use of a special 'tracheal funnel,' such as I have figured in Fig. 86. The sloping end serves for the earlier use with a mandrin, and allows a complete inspection of the whole length of the wound. The tracheal funnel is manufactured

necessity for the utmost caution, often discounted, however, by sudden movements, will give some idea of the difficulties involved in the examination of children. Fortunately, however, there are gleams of sunshine even in this difficult task. Children are as a rule very suitable for autoscopic, not only on account of the plasticity of the soft parts and the easy mobility of the vertebral column, but also, as Wild pointed out, on account of the transition from the pars laryngea pharyngis to the axis of the bronchi being straighter than in the adult. A relatively wider tube spatula can therefore be used, or better still, my grooved children's spatula with open-sided box. Orientation is facilitated with this latter instrument, so that full electroscopic illumination is obtained, and the first and the second movements can be readily carried out and a large field of vision secured. The spatula should not be held too obliquely, and the difficulty of keeping the midline on account of the mobility of the tongue should be minimized by using the handle previously described. A further maneuver consists in waiting, and using the brief moment of inspiration for the introduction, and in allowing an assistant to pump away the accumulated saliva as rapidly as possible. The "suction spatula" which I formerly used did not come up to expectation, for as in the case of other similar instruments, the saliva was only removed from the immediate neighborhood of the suction holes; it is better simply to put the pumping-tube into the throat. The use of the gag is often advantageous. Children's necks are very easily moved, and great care must be taken that the head is not unduly extended. The maintenance of the larynx presentation, when once it has been attained, is usually easy, but the view is apt to be limited to the short period of inspiration. Whether center-pressure autoscopic may be an advantage in children is as yet unproved. The procedure would scarcely diminish the autoscopic pressure, as this is in any case very moderate.

Direct tracheo-bronchoscopy. Lower method. There are no material differences from the procedure as carried out on adults. It is, however, very important in children with permanent tracheotomy tubes to use the short tracheal funnel described above, as this facilitates the accurate examination and treatment of the trachea in the neighborhood of the wound, and is especially useful in the region of the subglottic space. In examining the air passages the powerful movements of the lumen during respiration are very striking. Occasional forced expirations often bring about complete obliteration of the lumen accompanied by a

cough-like stridor. In the region of the smaller bronchi the movements of the lumen are very troublesome, as, owing to the swelling of the mucosa, the chance of satisfactory orientation is often dependent on the fleeting sight of the lumen obtained at the moment of inspiration. I have often noted this in cases of diphtheria. Every advance should be made cautiously, and where the presence of a foreign body is suspected, the result of the examination should not be deemed satisfactory until every branch on both sides has been presented, into which the foreign body might have been sucked.

Upper method. The upper tracheo-bronchoscopy of small children is one of the most difficult endoscopic pressures, and when the difficulties appear insuperable, beginners should be well advised to perform immediate tracheotomy, rather than exhaust the patient by fruitless attempts at introduction. If it is thought advisable to conduct the examination under local anesthesia, the technic of cocaineization described for direct laryngoscopy should be followed, and the air passages can be cocaineized through the tube after the larynx has been passed. The indications for general anesthesia have already been mentioned in Chapter II. To the special technic there mentioned should be added the recommendation that the autoscopic cocaineization of the larynx should not be undertaken until anesthesia is fairly deep, as the initial increase of reflex and the corresponding increase of salivation render the presentation of the larynx more difficult. It is helpful to pull the tongue out a little to limit its movements, whilst the use of a gag is often an advantage. The introduction of the tube calls for special mention, as departures from the technic normally applicable to adults are often inevitable. I shall put the normal procedure in the first place, the autoscopic introduction with the aid of a spatula in the second place, and the blind introduction with a mandrin in the third place. I will discuss the various procedures in this order, and will then consider their advantages and disadvantages.

1. The direct introduction of the tube spatula is naturally more difficult, owing to the diminished field of vision in children, than is ordinary autoscopic with a broad spatula. If the difficulties appear insuperable in the lying position, an attempt should be made in the sitting position, as I consider that this position is permissible, for a short time, even under a general anesthetic. If this fails, introduction in the left lateral position may be successful.

2. For autoscopic introduction with the aid of a spatula, an attempt should be made to present the

the larynx in children. While it is true that all methods are difficult to the beginner, the writer is not willing to concede that the work is as difficult as Brunings would have us believe. He uses no anesthetic and the five-millimeter tube in small children to pass the larynx and, while bronchoscopy is more difficult in them than in adults, he has always been able to see and to work through the smaller tube. Brunings claims that it is practically impossible to manipulate forceps through a five-millimeter tube, but his claim is not borne out by facts. Foreign bodies are often removed through this tube, and after a little practice one can see through it distinctly. With the forceps devised by Large, quite enough room is left to see through the tube and to remove foreign bodies. As the writer has said above, one should practice with the small tubes at every opportunity; the eye soon learns to see through it and it becomes almost as easy to work through it as the larger tubes. It is undoubtedly true that the method of illumination in the Jackson instrument is better for small tubes than Brunings' electroscope. In children over five years of age, the seven-millimeter tube can be used; but in younger children it is safer to use the smaller tube because it can be kept in the trachea longer without danger of edema of the glottis. Jackson has rightly said that the great danger of edema lies in the use of large tubes, and for this reason one should be careful about using the seven-millimeter instrument in small children. It must be remembered that the trachea in a child is short and the diameter is much less than in the adult, so that one can sometimes see a foreign body through the laryngoscope, especially if it is of any size, for such objects do not get into the bronchi. A small tube about eight inches long is all that is necessary to reach these objects in the trachea. The writer advises all bronchoscopists to become expert with the small tubes and to use them in little children in preference to the seven-millimeter instrument. It is more than probable that no American bronchoscopist will agree with Brunings' views as to anesthesia in children. The use of a ten per cent. solution of cocaine for painting the larynx in older or younger children is dangerous and in the opinion of the writer is never justifiable. It is safer to use ether if one feels that the child must have an anesthetic, but in all cases seen by the writer up to ten years of age it has not been necessary. In direct laryngoscopy it cannot be too strongly emphasized that no anesthetic is necessary for either examination or operation. In children beyond the age of ten years, the indirect method usually succeeds.

It is not necessary to say anything further about position in direct laryngoscopy. The writer feels that the supine position with the head straight is so far superior to the sitting position in the case of children that no argument is needed to prove it. One has only to try the two positions to be convinced. The writer has never seen the difficulties enumerated by Brunings under "examination" if the child is securely pinned in a sheet and the head held straight—not over the end—on the table. It is almost impossible for the child to struggle much under such conditions, and, as described above, the examination usually takes only a few seconds. The writer cannot imagine anything easier in tube work than the examination of the larynx in children, provided the head is straight and the proper tube is used.

The examination of the trachea and bronchi with the head in the "Boyce position" is the same as in adults with the head and shoulders over the end of the table. The tube is passed in the same way and the operator assumes the same position.

The writer's method of tracheo-bronchoscopy in children. The methods are practically the same as described for adults except that the smallest possible tube is used. Under five years of age the seven-millimeter is never used, while over that age it can be passed without much danger of edema. In children below the age of two years, the writer's favorite tube is Jackson's five-millimeter tracheo-scope, which is long enough to reach into the bronchi and, on account of its short length, is easily manipulated. It is always passed without the separable speculum with the head on the table and slightly extended. There is so little resistance in a child's throat that the tube is easily passed and, with slender, short forceps, one can work successfully through it. It is always well to give atropine before examining the trachea; children stand it well and it dries up secretions so completely as a rule that no pump is needed. It will be noted that the writer uses the straight position of the head in all his work; he has tried all methods and has come to the conclusion that it is the best position for the Jackson instruments, which he prefers to all others because they are simpler in his opinion and more easily handled. This may be due to the fact that he has worked so long and so successfully with these instruments. He feels sure, however, that with any instruments, the straight position of the head will simplify tube work. There is one thing in Brunings' chapter which ought to be remarked upon, and that is that he advocates that children's specialists should be qualified to do tra-

then he has used no other method in bronchoscopy. He is convinced that it, with the body elevated on cushions, will prove the simplest method for the beginner.

(To be continued.)

SURGERY IN HOMES BY THE GENERAL PRACTITIONER.*

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In this day of accessibility to hospitals and infirmaries most doctors are very prone to feel that the success of any operation is to a degree dependent upon such treatment as may be received in an institution equipped for their every need. This, to a certain extent, incapacitates some physicians from doing certain operations in the patient's home, while others simply for their own convenience do not care to do any kind of an operation outside of institution walls. On the other hand, there are innumerable patients who would submit to operative procedures if their physician would handle the case at the residence of the patient, when elsewhere they will not have it done at all. Many people still have a fear of hospital entrance which cannot be argued away.

It is a matter of common knowledge to any general practitioner that there are in his clientele dozens of women, for instance, with lacerations of perineal cervixes, etc., who would probably agree to plastic operations if the physician would do the work at the patient's home. Some will readily go to a hospital; many who are able to go will not, and many are not able financially. Many will not go at all.

The term "general practitioner" in this article is meant to imply that the physician handles everything that comes to him—from a colic, or obstetrics, or gonorrhea, to an amputation or a laparotomy.

The average physician upon graduation may not be inclined nor feel competent to attempt some forms of surgery that may not be considered emergency in nature, and therefore refers many of his cases to some doctor who has access to a hospital or infirmary. In some cases the man to whom the patient was referred has been known to forever after retain the patient in his practice.

If the general practitioner cares to handle these non-major cases, the vast majority of them can be treated with surprisingly good results in the patient's home, and without trained nursing, if the patient prefers for financial or other reasons not

to enter an infirmary. This is not to be construed in any sense as an argument against hospital care. It is only to show that everything is not dependent upon it, and that the general practitioner can add to his usefulness and income without detriment to the interest of his patient.

If the general man feels "shaky" about his knowledge, he has as much access to his anatomy, works on operative surgery, etc., as any one else had to the same information. In fact, he should be absolutely sure, if possible, of what he is going to do, and to this end it is advisable for him to take post-graduate courses in operative work that he may the more successfully attempt this practice. The patient who prefers to have some surgical intervention done at home is just as much entitled to have a first-class operation as is the better situated patient who can afford all the luxuries and conveniences of a private infirmary combined with the skill of an expert. Therefore, *this paper is not advocating the attempt to do work by incompetents, but just the contrary.* Any doctor can prepare himself to do this work if he will follow the outlines given above.

Any physician who has handled a large mining camp practice knows the great number of serious injuries the miner receives, and the success in treatment achieved in these cases—the vast majority of which never darken the door of a hospital. There are even many major amputations done by the general man in the country with brilliant success which are never heard of by his more fortunately situated city brother. Frequently emergency laparotomies are done by the general man in isolated regions, especially for gun-shot wounds, where a wait for trains to convey the patient to a city institution would spell disaster.

With a White dental foot drill, using the ordinary dental burrs, many cases of open fractures have been wired with marked success. Those who have used the dental drill for this purpose will probably agree that it is a far better instrument for the purpose than the ordinary hand bone drill, and in some instances it has even been used in trephining the skull.

Among the large number of surgical procedures which the general practitioner can do as successfully at the patient's home as in a hospital may be mentioned the following:

All trachelorrhaphies and perineorrhaphies, all dilations and curetments, paracenteses abdominis for acites, most amputations of extremities which involve parts of the arm below the shoulder joint, and of the lower extremity below the knee, opera-

*Read before the Jefferson County, Ala., Medical Society, March 9, 1914.

Ether is probably the anesthetic of choice for a home operation, on account of its cost, ease of administration, and its great safety. The anesthetist ought to arrive a few minutes before the time designated for the operation, giving the patient an opportunity to get acquainted with him. The patient may be anesthetized on the bed or on the table, as is more convenient. Under no circumstances should either physician be late, because frequently the patient will for that account postpone the operation, and perhaps not have it done at all.

The doctor prepares himself during the administration of the anesthetic, and the patient, after she is on the table in the usual manner for the operation, but wants to bear in mind that operations done in the patient's home must necessarily be attended with more dependence upon continuous use of antisepsis during the operation than upon asepsis. With this idea constantly uppermost he will experience very little trouble in readily adapting himself to the situation, and soon learn to like the work in this field.

By using leg holders there is no need of having more than three people in the room identified with the operation—the anesthetist, the physician, and the person who is to assist him. In many cases this assistant could be the doctor's wife. In almost every neighborhood there is always some woman who is rather anxious to be considered able to help in operations, and the physician can give her working instructions as to what is meant by being surgically clean, and it is surprising how quickly this woman will take to the work. There is hardly ever any need of having a graduate nurse for the assistant, though it is more convenient. Of course, it is better to have a regular assistant on account of having someone able to anticipate the wants of the operator. Even an emergency abdominal operation in the country can be done with just three persons. For the class of operations listed in the beginning of this paper there is absolutely no need for more than the anesthetist, the operator, and the assistant.

The conclusions herein are derived from a series of these operations covering a period of ten years, and embracing nearly one thousand of the various operations combined. In the series referred to there were seven emergency gun-shot wounds of the abdomen which were operated upon in the country.

The mortality rate in operations done in the residence has been zero, except that of the seven abdominal gun-shot cases three died.

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PRACTICAL PROCTOCLYSIS. DESCRIPTION OF A SIMPLE APPARATUS.

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Proctoclysis is a method more or less familiar to all of us and very little that is new is likely to be presented. To me this subject has been of great interest since its inception, and I have utilized the procedure extensively. I am fully convinced that we do not employ it enough. I attribute the good results in my abdominal operations to the employment of Fowler's position, abundant drainage wherever indicated, and to proctoclysis.

I usually employ normal salt solution (0.6%) as recommended by Murphy, using up to ten pints, and then I drop to half normal solution, since it has been shown by T. Lawson (1908) and by H. H. Trough (1912) that tap water is absorbed as readily as if not more readily than a saline solution without any deleterious results. An excess of sodium chloride is harmful as is evidenced by dropsical changes in the tissues. In nephritis I use tap water only, as salt seems to interfere with the secretion of the kidneys. Murphy states that "this is worthy of consideration when we realize that the patient receives three and a half thousand to nearly thirty thousand grains of salt every twenty-four hours, depending on the manner of preparation, when being forced on an average of eighteen to twenty-four pints in twenty-four hours." Trough states that tap water relieves thirst better than salt solution, and some of his patients stated that they could taste the salt whenever the saline was resorted to. I have found that unheated water of room temperature is readily absorbed from the rectum. It is particularly effectual and harmless in fever cases, for we know that cold water by the mouth is relished much more than hot water, no matter how sick the patients are, and especially is this true when they have fever. Many collapse cases that have icy cold extremities accompanied by cold perspiration will on examination be found to have high rectal temperature. Why aggravate such a condition? The indication is to draw the blood and heat to the surface and to the extremities and this must be accomplished by means other than proctoclysis.

Proctoclysis is nearly always administered by the drop method at the rate of about sixty drops per minute. It has been found that when a greater amount is given at one time, even with intervals of rest, the rectum soon becomes intolerant and expels the liquid so that the whole treatment must be

tube close to the rectum, delivering the saline solution warm. We now have several other heating devices. In the *J. A. M. A.*, April 17, 1909, Murphy published a drawing of his above-mentioned primitive apparatus which did the work as well as any until then. B. B. Weckler, *J. A. M. A.*, added a can surrounding it and containing hot water. In March, 1909, G. Y. Saxon arranged a similar contrivance and his apparatus afterwards sold for \$12.00. He also insulated his tubes with asbestos and regulated the flow by a pinch-cock. All these seemed too artistic and complicated to me. All had a tendency to make the apparatus expensive and cumbersome.

Some were of the opinion that it was very important to keep the solution in the can constantly hot. In October, 1909, Harlein (*J. A. M. A.*) and I. M. Garrat (*J. A. M. A.*) reported the use of their vacuum bottles, the former an inverted one, the latter an upright one. A modification of Harlein's, mounted on legs, by P. Magnuson (*Surg., Gynec. and Obst.*, February, 1910), sells for \$12.00. He added a thermometer near the anus, and no doubt discovered that the water reached the anus quite cool. P. Wroth (*Surg., Gynec. and Obst.*, November, 1909) took up the discarded funnel method, but ran his tube practically between two hot-water bags near the anus. The Meinicke saline solution heater of 1914 is based on this principle. It is the latest addition to the proctocyclis armamentarium, so far as I am aware. It is a metal fountain syringe with a metal tube through which the rubber tube is drawn.

I have tried for several years to perfect an apparatus that would embody the correct scientific principles in a practical, simple form, and in June, 1909, I published my first report in the *Journal of the American Medical Association*. This apparatus was tried out by Dr. John B. Murphy and he reviewed it in the yearbook for 1910, and, according to Sharp and Smith, he uses it now in the Mercy Hospital. However, I have again improved it so that to-day it is a more simple, practical, and durable yet scientifically accurate apparatus. "The more simple the appliance the more practical it will prove" (Murphy).

My apparatus (Fig. 1) consists of a can with a spout in which two stopcocks are successively attached, one for starting or stopping the flow, the other for dividing it into drops. After the latter is set it is unnecessary to resort to any adjustment again, as the flow can be stopped or started by the first cock at any time. Next to the cocks there is a return pipe, the hollow handle of the can, for the

relief of back pressure of gases or of liquid. My two-way dropper (Fig. 2) is connected to the spout by rubber tubing. The regulation of drops by all former apparatus was difficult on account of the back pressure which caused the drops to be irregular and even stopped them entirely at times. In the central diaphragm of my dropper is a tube running downwards for the drops, and one tube running upwards for the gases. This eliminates the back pressure, and the drop flow constantly and regularly, to the great relief of all concerned. It also eliminates one of the rubber tubes. I have found this dropper of great efficacy and a trial by some of the most prominent surgeons with large experience with the methods of proctocyclis has won for the dropper their enthusiastic endorsement.

When the apparatus is in use the dropper should never hang higher than fifteen inches above the arms of a grown person, so that an excess of hydrostatic pressure of fifteen inches can be observed

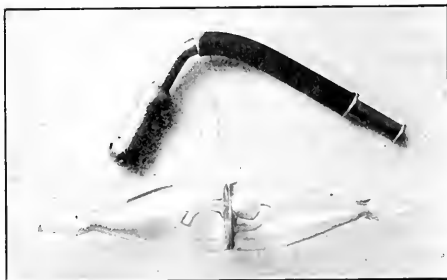


Fig. 2.

at once by the liquid backing up in the dropper. When this occurs, the flow should be stopped temporarily, as experiments have shown that the largest hydrostatic pressure that can be comfortably borne by the rectum without revolt is fifteen inches. More than that will cause the tip to be expelled and the liquid discharged into the bed. The patient soon learns to watch the dropper and to call the nurse when he sees the solution back up. The drops should be adjusted to flow about sixty per minute and about one pint should be given per hour with one intermission after every two hours. "Less than eight pints in twenty-four hours is of little use" (Murphy).

I use a rectal tip (Fig. 2) with an aluminum head with a number of large holes in it, and insulated by rubber outside of the anus. The bulb is automatically retained above the internal sphincter and is not easily expelled. When the liquid is

the recipient an almost exsanguinated hemophiliac. The posterior ulnar veins were chosen in both patients. A Brewer's glass cannula dipped in hot alcohol was used for the operation, and adjusted into the veins. In order to raise the pressure in the donor's veins, it occurred to me that a pneumatic and controllable cuff about the arm might be more satisfactorily managed than the usual elastic bandage. A sphygmomanometer cuff was therefore applied around the upper part of the arm and inflated to a degree just short of shutting off the radial artery. All the veins of the forearm became greatly distended, including the one used in the anastomosis. A temporary withdrawal of the cannula from the vein of the recipient demonstrated a steadily flowing blood stream of great volume and force. The transfusion was rapidly and satisfactorily finished.

I have now had occasion to perform transfusion four times (two in one patient) by this method, and I have adopted the following general plan of procedure. The two patients are placed on properly cushioned operating tables with their feet in opposite directions. The left forearm of the donor is made to come in contact with the left forearm of the recipient on a padded board connecting the heads of the two tables. A sphygmomanometer cuff is placed about the upper part of the donor's arm and the blood pressure read. After aseptic preparation the posterior ulnar vein of the donor is dissected out by an assistant while a suitable vein is being similarly prepared on the recipient. The latter vein should be chosen nearer the elbow and more ventrally on the forearm (the anterior ulnar). The elbows are approximated and the two forearms are held up by an assistant, each at a right angle from the arm. The cannula is then inserted into the vein of the donor and tied in with catgut. The assistant compresses the vein against the muscles with a finger which relaxes every few seconds, allowing an instant of free flow to insure against clotting. The recipient's vein is opened and the other end of the cannula inserted. Both veins are tied loosely over the cannula with one double catgut slipknot which can be loosened quickly and later retied should it become necessary to inspect the flow or exchange cannulae. When this must be done each vein is gently compressed with a finger. Warm alcohol is applied to all exposed tissues repeatedly during the operation. The sphygmomanometer cuff is now inflated until the index shows a pressure of ten or fifteen less than that previously ascertained to be the arterial pressure. All the veins of the forearm become greatly dis-

tended and a strong and steady stream is forced through the cannula. By carefully watching the veins at each end of the cannula it is not difficult to learn whether the transfusion is progressing satisfactorily or not.

After the transfusion has been successfully established it will become necessary to advise the assistant who manipulates the sphygmomanometer to vary the pressure from time to time in order to keep up the maximum tension within the vein. For best results, the inflation of the sphygmomanometer should strike the theoretical point where all veins are shut off and the brachial artery is left open. This would mean an even flow of blood through the cannula corresponding in volume to that of the brachial artery. The donor must be carefully and constantly watched and placed in Trendelenburg position immediately if this rapid loss of blood causes faintness or beginning of shock.

I believe that this steady and voluminous venous flow of blood is of distinct advantage over arterial transfusion in being less apt to cause clotting and in shortening the time of transfusion. Besides, it overcomes the other objections mentioned at the beginning of this article. For raising and controlling the venous pressure in the donor, the pneumatic sphygmomanometer is a most convenient and practical instrument.

TO FIND GONOCOCCI IN THE FEMALE.

A common mistake in examining the secretion in the female is to take it from the vagina, which is full of organisms of all sorts. The three points from which secretion should be obtained for examination are: the cervix, the urethra, and Bartholin's gland. Gonococci are more likely to be present if the secretion be obtained just after the cessation of a menstrual period or as the lochia is beginning to diminish after the emptying of a pregnant uterus. If difficulty is encountered in demonstrating the organism in a suspicious case, slight traumatism to the points from which the secretion is to be obtained and the taking of the smears twenty-four hours later will sometimes result in more organisms being present in the discharge and thus facilitate their demonstration. A similar result may be obtained by a chemical irritation, such as the application of a strong solution of silver nitrate and the examination of the increased secretion thus produced.—CHARLES C. NORRIS in the *Long Island Medical Journal*.

authorized to serve as anesthetists. If such a procedure be desirable, it will become incumbent upon the medical profession, through the hospitals, to afford nurses—all of them, in course, or some of them specially selected—such practice under supervision as may be necessary to develop their efficiency in this phase of surgical assistance. It may be argued that a general medical training is essential to develop a careful and efficient anesthetist. The practical answer is found in the experience of large hospitals wherein nurses have been very successfully employed as anesthetists. If practically their employment has been advantageous to the surgical service without in the slightest degree endangering the patients, it is difficult to maintain that nurses with a lack of medical training cannot be efficient anesthetists.

From the standpoint of medical economics, there is naturally objection to the preemption of any part of medical work by others than physicians. In the development of social progress, however, the welfare of the community alone is considered and the particular disadvantage to any particular profession receives but little consideration. At the present time, it is safe to say that the work of anesthesia belongs to the medical profession. If nurses are to be given this field of work, it is because surgeons desire them to occupy it and are willing to give them the advice, training, supervision and direction necessary to enable them to master this important branch of work.

There is little necessity for arguing with legislatures nor for blaming the community when the solution of the entire problem is distinctly in the hands of the profession itself. There is only one question involved: "Do surgeons desire nurses to administer anesthetics?" If the answer be in the affirmative, the laws should be altered so as to include the administration of anesthetics within the activities delegated to the nursing profession. If surgeons are opposed to nurses as anesthetists, no legislation is necessary. It merely remains with the profession to discontinue the use of nurses in this capacity and to discourage their employment in hospitals, private institutions and private practice.—I. S. W.

DR. CRILE AGAIN HONORED.

The latest of the many recognitions this year bestowed upon Dr. George W. Crile is the 1914 *American Medicine* gold medal, conferred upon him as the American physician who, in the judgment of the trustees of the award, has performed the most conspicuous and noteworthy service in the

domain of medicine and surgery during the past year.

Monumental was Crile's work in the establishment of a safe method of blood transfusion. Equally large in effort and dignity are his very important contributions to our knowledge of shock. His development from them, more particularly from his kinetic theory of "anoci-association" methods in operating, is the particular achievement that has singled him out this year for various conspicuous honors here and abroad. Whether or not his teachings concerning shock and his anoci-association procedures will be as lasting additions to medicine as blood transfusion, these honors were fairly won.—W. M. B.

Surgical Suggestions

In typical abdominal hysterectomy only three ligatures on each side are needed, viz., the ovarian vessels, the round ligament, and the uterine vessels.

Bilateral inguinal herniae that pop out on coughing and immediately recede when the patient is recumbent are usually direct.

Bones, like the tissues, are intolerant of foreign bodies. Don't be too enthusiastic in recommending metal plates or screws for fractures if non-operative treatment or the application of a bone graft gives promise of success.

The "pneumonia" that occurs as a post-operative complication is quite different in several respects from primary lobar pneumonia and especially in the prognosis.

Do not be too sure that a small breast tumor is not cancerous because the patient is young. Such a small tumor even in the breast of a young virgin is sometimes scirrhus.

If a patient with esophageal obstruction can painlessly swallow fluids, gastrostomy will increase his discomforts but not his nutrition.

As a rule the nature and consequences of a contemplated gastrostomy or colostomy for carcinoma of the esophagus or the rectum ought to be clearly explained to the patient himself. Many individuals would reject such temporary palliation, the employment of which without the patient's consent is justified only by complete obstruction.

Surgical Sociology

Eric S. Weiss, M.D., Department Editor

For a complete and up-to-date listing of all articles published in this journal, please refer to the Table of Contents on page 10. The following is a list of the articles published in this issue, along with the names of the authors and the page numbers on which they appear.

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Massachusetts, Indiana, Nebraska, Pennsylvania, Oregon, South Carolina and Connecticut.

In the Report of the New York State Factory Investigating Commission reference is made to the hard and physically exhausting work done by women in factories and there is recognition of the fact that "the nervous strain resulting from monotonous work and speeding up, intensified by the piece-work system, when coupled with excessive length of working hours, can only result in undermining the whole physical structure of the woman, lowering her vitality and rendering her easily susceptible to the diseases that find their prey among factory workers." In its opinion the first step in the right direction is to decrease the length of the working day for women, and it believes that a statute is necessary to provide legally that no woman may be employed in a factory after a certain hour. While no specific recommendation was drawn, the commission felt that the most important factor to enable enforcement of laws as to the hours of women is some valid provision fixing a closing time.

It is difficult to determine the actual effect of night hours upon women in terms of surgical conditions. From a recognition of the general physical and moral hazard that is involved, together with a lack of hygienic conditions which exist in night occupations, it is apparent that night work of women plays a serious part in lessening their general health. To this extent, the law limiting the hours of women in night work at factories warrants the cordial support of the profession.

Book Reviews

Traité Médico-Chirurgical de Gynecologie. By MM. F. LABADIE-LAGRAVE, and FÉLIX LEGNEU. Octavo; 491 drawings, black and white and in colors, in the text; Fourth edition revised and enlarged. Paris: FELIX ALCAË, 1914. Price, \$6. (30 francs.)

This classic treatise appears in its fourth edition as the most complete single book on gynecology in the French literature. The authors' grouping of their material may well be followed as the most modern and rational classification of gynecologic affections. The first part of the book embraces the general aspects of gynecologic disease; the second part treats of their special features. The grouping of the latter is based upon established facts of pathology. All the conditions are thus embraced under the headings, *malformations, traumatism, acquired deformities, infections and tumors.*

The abundant references to the most recent development in gynecologic pathology, in experimental pathology and biochemistry, the addition in the text of the latest accepted surgical operations, amply illustrated by 135 new figures, all serve to emphasize the value of the book not only to the student, but also to the specialist. One especially noteworthy chapter is that on the complications and the sequelae of gynecological operations, while another

chapter is devoted to a study of the pathologic relations between the genital and the urinary apparatus. The important question of radio-therapy in the treatment of fibromyomata and cancer of the uterus also finds ample place in the book.

The International Medical Annual: A Year-Book of Treatment and Practitioners' Index. 1914. Thirty-second Year. Octavo; 716 pages; illustrated. New York: E. B. TREAT AND CO. Price, \$3.50.

The thirty-second yearly volume of this medical annual maintains the high standard set by the previous volumes. It contains excellent abstracts on the most important literature of the past year dealing with the treatment of medical and surgical conditions.

In the section on therapeutics there is a special chapter by Profs. Von Noorden and Falta on thorium and its uses.

It is only rarely that one finds a year-book made up as this one is of numerous abstracts, which the reader can pick up not merely as reference material, but as interesting reading. The literary style of the subject matter is of the best, so that the reader is not bored by the monotony so commonly found in collective abstracts.

Although the contributors to this volume are almost all Englishmen, there is no partiality shown in the literature abstracted, for French and German periodicals are well represented.

The high class of the illustrations, of which there is a great number, also adds to the attractiveness of the book; while the completeness of the index, in spite of the alphabetical arrangement of subjects, leaves little to be desired. As a handy book of reference for recent advances in medicine and surgery this book, for its size, can certainly not be surpassed.

Blood-Pressure in Medicine and Surgery: A Guide for Students and Practitioners. By EDWARD H. GOODMAN, M.D., Associate in Medicine in the University of Pennsylvania. Octavo; 226 pages; illustrated. New York and Philadelphia: LEA AND FEBIGER, 1914.

This little book will be found to contain a very good exposition of the present state of our knowledge concerning blood-pressure. After a brief description of the physiology of blood-pressure and the various instruments used in its determination, the author discusses the pressure in various disorders. The chapter dealing with hypertension in nephritis is particularly good and the newer views of renal disease, as put forth by the French school, are discussed. The book is made particularly useful as a book of reference, as the titles of all articles referred to in the text are given as foot-notes.

Progressive Medicine. Edited by H. A. HARE and L. F. APPLEMAN. Vol. II. June, 1914. 460 pages. Philadelphia and New York: LEA & FEBIGER, 1914.

The volume contains reviews by W. B. Coley upon Hernia; by J. C. A. Gerster on Surgery of the Abdomen; by John G. Clark upon Gynecology; by Alfred Hengel upon Diseases of the Blood, Diabetic and Metabolic Diseases, Diseases of the Thyroid Gland, Spleen, Nutrition, and the Lymphatic System; by Edward Jackson on Ophthalmology. These reviews maintain the high standard for which these numbers are noted.

Books Received.

Diseases of the Rectum and Colon and Their Surgical Treatment. By JEROME M. LYNCH, M.D., Professor of Rectal and Intestinal Surgery, New York Polyclinic; Attending Surgeon, Cornell Dispensary; Fellow of the American Proctological Society, New York Gastro-Enterological Society, etc. Octavo; 583 pages; 228 engravings and 9 colored plates. Philadelphia and New York: Cloth, \$5.00, net. LEA & FEBIGER, Publishers, 1914.

Guiding Principles in Surgical Practice

1. $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$

Medical and Surgical Reports of the Episcopal Hospital, Philadelphia.

Surgical Diseases and Injuries of the Genito-Urinary
Organs

Abdominal Surgery 3027

Progress in Surgery

A Resume of Recent Literature.

Pituitrin; Its Abuse and Dangers.

[illegible]

...the ...

THE FLOWING OF A FLUID THROUGH A CIRCULAR PIPE

which may be written

leaving the rest of the world in a state of confusion.

RECEIVED MAY 19 1964

situation. The corpus luteum is rapidly formed and corresponds in time with the premenstrual thickening of the uterine mucosa which it is responsible for. On the 24th to the 28th day following the beginning of the last menstruation, the corpus luteum becomes completely formed, the premenstrual conversion of the endometrium is completed, and now the anatomical menstruation begins. In the case of an impregnation the ovum must have arisen after the last regular and normal period.

Functional Kidney Tests. W. E. STEVENS, San Francisco, *Journal American Medical Association*, May 10, 1914.

Stevens reports the findings from the application of 108 tests, using in the majority of cases after catheterization of the ureters, the phlorizin, phenolsulphophthalein and urea tests simultaneously to determine their comparative functional value. He remarks that to speak authoritatively one must be thoroughly familiar with their technic. This is especially true of the phlorizin test and to some extent with the phenolsulphophthalein test. His method was to use three sets of two bottles labeled K and L for collections from the right and left kidneys. After catheterizing the ureters, 2 c.c. of an 0.5 per cent. of a phlorizin solution was intramuscularly injected. While waiting for the appearance of sugar, enough urine was collected in bottles numbered 1 for the microscopic examination and the quantitative urea estimation. As soon as the reduction of heated Fehling's solution became apparent on both sides, the urine was collected for fifteen minutes in bottles numbered 2. At the end of this time 1 c.c. of a phenolsulphophthalein solution containing 0.06 per cent. of the dye was injected intravenously and the urine then permitted to flow into the two test-tubes containing a 25 per cent. solution of sodium hydroxide. As soon as the characteristic discoloration occurred in both tubes, the time of appearance was recorded and the urine collected for fifteen minutes in bottles numbered 3. The amount of urea was determined by two Doremus ureometers and the amount of sugar by two Lohmstein saccharimeters. The phenolsulphophthalein estimations were made by colorimetric test-tubes, as described by Cabot. His conclusions, in substance are: In normal cases the phlorizin, phenolsulphophthalein and urea tests show almost identical values for both kidneys. In the pathologic cases all three show almost equally low values on the diseased side as compared with the healthy side, thus showing their almost equal practical value. The simultaneous use of the tests as described tends to greater accuracy is not specially time-consuming or complicated and can be done by an intelligent nurse. Moreover, it gives positive assurance as to which kidneys is performing the most work. In pathologic cases a coincident lessened functional value on one side points unmistakably to a marked defect on the corresponding kidney. This with a normal functional value on the opposite side and satisfactory total functional values as shown by blood cryoscopy, the bladder phenolsulphophthalein test, etc., would permit the removal of the diseased organ. A single renal test would not justify such an operation. Prior to operation comparative functional tests should be strengthened by tests of total renal function. The urea is the quickest test performed and with a minimal discomfort to the patient. It is not based on the elimination of a foreign substance. As compared with the phlorizin test, the phenolsulphophthalein test is subject to fewer technical errors and is less time-consuming, a factor of no little importance to the patient as well as to the physician. On the other hand, the quantitative estimation of the excreted dye, even with the Duboseq colorimeter, is subject to a not negligible amount of error, while following phlorizin injection the estimation of sugar by means of the Lohmstein saccharimeter is mathematically correct."

Atresia Recto-Vesicalis. F. C. HERRICK, Cleveland, *The Cleveland Medical Journal*, June, 1914.

After reporting a case of recto-vesical atresia which was successfully operated upon in the fifth month of life, the author suggests the following points in the management of such cases:

Early operation, if possible within the first 48 hours of

life. With the child in the lithotomy position, and the hips highly elevated, a midline incision should be made where the anus should be. Dissect upward and backward with blunt and sharp dissection. If the gut is reached, it should be loosened, brought down as far as possible and stitched to the skin. If unsuccessful in reaching the gut, a left inguinal colostomy should be immediately done. Thrusting a trocar through the perineum, a procedure which has been suggested, is inaccurate and should not be done.

The above procedures have been only moderately satisfactory, and it is left for plastic surgery in the future to accomplish better results.

The Practical Value of Posterior Urethroscopy. M. ROTH AND T. MAYER. *The American Journal of Urology, Genereal and Sexual Diseases*, May, 1914.

Considerable experience is necessary for the correct interpretation of the pictures obtained by posterior urethroscopy. The most important cause of pathological changes in this region is gonorrhoea. Numerous abnormalities are found in patients suffering from sexual neurasthenia. The chief point made by the authors is that the importance of the local condition in the latter group has been greatly overestimated, for they have obtained cures in 80 per cent. of these cases by general treatment either alone or combined with local therapy that did not alter, in any way, the pathological picture in the posterior urethra.

A New Operation for Varicocele. (*Eine neue Methode zur Operation der Varikokele.*) R. FRANK, *Zentralblatt für Chirurgie*, April 4, 1914.

The conventional operation (resection of the pampiniform plexus and approximation of the two ends) according to Frank possesses the great disadvantage that it not uncommonly causes degeneration of the testis. Frank has devised the following operation to obviate this. Inguinal incision; dislocation of the testicle through the wound and division of the Hunter ligament, so-called, which fixes the testicle to the bottom of the scrotum; a narrow flap of fascia made from the aponeurosis of the external oblique is then formed with base downward; this is turned down into the scrotum and sutured to the divided Hunter ligament; closure of the wound. In this operation, as is obvious, the testis is turned upside downward. Frank's results have been excellent both functionally and cosmetically.

Concerning Dystrophia Adiposo-Genitalis. JOHANNES WEICKSEL, *Münchener Medizinischer Wochenschrift*, June 2, 1914.

The case of a youth of 15½ years is reported who showed all the evidences of the Fröhlich symptom-complex, although the sellaturicæ as revealed by the x-ray was not appreciably enlarged. His weight was 136 pounds; his height, 148 cm; chest circumference, 96 cm. Another striking feature in this instance was the presence of a marked eosinophilia. The mentality was not alert, yet the boy was graduated from the public school.

A Useful Modification of the Adhesive Plaster Dressing in Operations for Hare-Lip. (*Eine zweckmässige Modifikation des Heftpflaster Verbandes bei Hasenschartenoperationen.*) R. HAGEMANN, Marburg, *Zentralblatt für Chirurgie*, May 23, 1914.

This modification consists simply in applying the adhesive plaster so that the middle part lies directly over the mouth instead of over the suture line. In this way the suture line can be kept cleaner and under better observation; furthermore, it holds the upper lip perfectly passive, even when the child cries. The plaster is applied so that a small opening exists at the upper part of the mouth through which nourishment can be taken.

Splanchnometosis and Its Treatment.

to a certain extent, the results of the present study are in agreement with the stratification of the subdermal papillae in the skin of the two species. The orientation of the papillae in the skin of the two species is different. In the present study, the papillae in the skin of the two species were relatively elongated and oriented vertically along the skin surface. This may be an adaptation to the skin surface of the two species. The latter may be an adaptation to the skin surface of the two species. The latter may be an adaptation to the skin surface of the two species. The latter may be an adaptation to the skin surface of the two species.

The full work programme was completed by Week 10, with long median night. Ongoing results: 1. both rectus-muscle and, therefore, the thoracic rib from 7 scapulas. Extensive vertebral and thoracic health and fixation of the field of the muscles. Ongoing work on the 'treatment' of the thoracic rib from the same patient.

An Experimental Study of Intestinal Obstruction.

U.S. DEPARTMENT OF AGRICULTURE
WASHINGTON, D.C. 20250

May 15, 1974

Supraclavicular Anesthesia of the Brachial Plexus

A Case of Collapse Following Its Administration

Elephantiasis and the Kondoleon Operation.

Received: March 20, 1994

The Use of Heparin in the Transfusion of Blood

that would serve to prevent coagulative changes long enough to permit safe transfusion under the best technic. From their experiments it was estimated that about 3.5 mg. of herudin to 100 c.c. of blood would be requisite, without the aid of paraffin, provided good technic was employed in obtaining the blood free from a mixture of tissue juices. When a paraffin coating was applied to the tip and neck of the transfusion pipet, the amount could be reduced by half. These results are shown by a table presented. Directions are also given as to the paraffin coating in the practical application of the method.

The Role of Orthopedic Apparatus in the Treatment of Surgical Tuberculosis by Sunlight. P. REDARD, Paris. *Annales de Médecine et Chirurgie Infantiles*, May, 1914.

The author believes that in the enthusiasm which has followed the excellent results obtained in the heliotherapeutic treatment of surgical tuberculosis, the rôle of orthopedic apparatus has been much neglected. Whereas there is no doubt that the very mild types of cases, especially those in which joints are not involved, will heal when exposure to sunlight is used alone, the more serious cases should be treated by means of apparatus besides. In general, heliotherapy is difficult when casts are used, and for this reason the immobilizing apparatus should be simple in order to allow as much of the body as possible to be exposed to the light. Casts when used should contain numerous fenestrae.

The Etiology of the Ulcus Ventriculi: A New Theory Based on Experimentation. (Zur Ätiologie des Ulcus Ventriculi; Eine Neue Theorie auf Experimenteller Grundlage.) B. STUBER, *Münchener Medizinischer Wochenschrift*, June 9, 1914.

Based his theory on the clinical observation that a considerable number of patients with ulcer ventriculi vomit bile and intestinal content, Stuber sought to produce in animals distinct ulcers of the stomach. By excising a square area of the musculature of the pylorus he first induced pylorus-insufficiency. This lasted for about a month. During this time he fed the dogs only bread, potatoes and milk with the object of diminishing the well-known hyperacidity of these animals. In all these animals there were found in the course of three months multiple ulcers situated chiefly at the antrum of the stomach and on the lesser curvature. The animals manifested symptoms which were not unlike those in the human under similar pathologic conditions. Blood was noticeable in the feces. In a similar number of animals used for control, the pancreas was ligated at the same time, as the pylorus was rendered insufficient. In these animals no ulceration resulted.

Hence, Stuber feels justified in the conclusion that under pathologic conditions as imitated by his experiments, it is possible to cause an increased and more frequent regurgitation of intestinal ferments into the stomach and consequently typical ulcera ventriculi. When trypsin is fed by mouth, healed ulcers become again disturbed and typical ulcers may again be formed. Stuber calls this type of ulcer *ulcus trypticum* and suggests that very likely the same condition may obtain in man.

Anatomico-Pathological and Experimental Study of the Surgery of the Offices of the Heart. A. CARREL and TH. TUBBIER, Rockefeller Institute, N. Y., *The Medical Press and Circular*, May 27, 1914.

The authors report an investigation of the pathological anatomy and clinical aspects of cardiac surgery and the experimentation required to develop satisfactory operative technic. They believe that pure mitral stenosis, certain aortic stenoses and some stenoses of the pulmonary artery will be found to be susceptible of benefit by surgical intervention. Only those cases which are progressing rapidly to a fatal termination are suitable for this treatment. Surgery might then transform a sure fatal stenosis into a relatively mild insufficiency.

The following are the chief dangers to be avoided in

such interventions: Wounds of the coronary arteries, hemorrhage, entrance of air into the cavities of the heart and arteries, and finally thrombosis.

The coronary vein may be tied with impunity, but not at its extremity, owing to the supply of venous blood the heart derives from the foramina. Lesions of the peripheral portion of the coronary artery are well borne. A wound of the coronary artery near its origin, even when made with the finest needle, always causes momentary arrest of the heart's action, which is followed by a relatively prolonged arrhythmia. Application of a ligature between the origin and bifurcation of the coronary artery is always fatal; the heart is arrested in diastole and resuscitation is impossible.

The occurrence of hemorrhage is not so serious—obliquely directed wounds of the heart will bleed less freely than others. The one hemorrhage which is most difficult to arrest is that occurring when the right auricle is torn, owing to the extreme thinness and friability of its wall.

Air embolism entering the right side of the heart is not as serious as that on the left side on account of the cardiac anemia resulting from emboli in the coronary arteries.

The slightest degree of myocarditis leads to thrombosis. Wounds must, therefore, be absolutely approximated.

The topography of the heart in regard to those zones which are dangerous to manipulate and those which are manageable is next discussed. The danger zones are the proximal portions of the coronary arteries; the interauricular septum, the auriculo-ventricular border. The left auricle is particularly amenable to approach. The endocardium is much more sensitive than the other cardiac tissues, doubtless through the influence of the sub-endocardial nerve plexus. The parenchyma of the heart, however, is extremely tolerant of approach, so that the cavities of the heart may be opened singly and their walls resected, without grave injury to the ulterior functional capacity of the organ.

The remainder of the paper deals with a detailed description of the operations performed. Three procedures may be used in dealing with orificial stenosis: internal valvulotomy, which is analogous to internal urethrotomy; external valvulotomy including cardiotomy, and finally auriculo-ventricular or arterio-ventricular anastomosis, which consists of placing the segment of the vascular circle which is situated in front of the constriction in communication with that beyond the same, through the medium of a "derived" canal.

Operation vs. Irradiation. (*Operation oder Bestrahlung.*) CHRISTOPH MÜLLER, *Münchener Medizinischer Wochenschrift*, June 2, 1914.

The number of cases of carcinoma so far treated by x-ray and radium has not been sufficiently large to make comparative deductions. But three years have passed during which time a fairly large percentage of the cases so treated has remained without recurrence. Compared to a similar number of cases surgically treated the results according to Müller are more favorable with the non-operative form of treatment. Besides, the superior advantage of irradiation is in those anatomical regions where surgery has no approach as in the thorax. Lung and pleural metastases can be subjected to the x-ray; carcinoma of abdominal viscera including their regional lymph nodes can also be attacked by the ray. While the brilliant results obtained through surgical technic cannot be gainsaid, Müller urges that the work with the radio-active substances be further promoted, as already they have been proved to be a potent means against cancer.

Treatment of Pruritus ani. J. CRAPPER, Chepstow, *British Medical Journal*, May 2, 1914.

Crapper recommends two simple remedies, both of which in his experience are remarkably efficient. The first is ordinary Tr. Iodine; the second, and even better remedy is the compound tincture of Benzoin. Within a minute of two after applying this remedy, the desire to scratch is over. It may be used two or three times daily and it never irritates.

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No. 9

IONIZATION TREATMENT OF CANCER. END RESULTS OF TWENTY YEARS' WORK: A SUMMARY OF 300 CASES.*

G. BELTON MASSEY, M.D.,

PHILADELPHIA

On July 31, 1893, I discovered by accident that a local cancerous growth could be conveniently devitalized by driving into it certain parasitocidal chemicals by a direct electric current. Since that date, now more than twenty years ago, a large portion of my time has been spent in improving the technical details of this process and ascertaining its indications and limitations. Another worker in the same field, Prof. Stéphane Leduc, of the School of Medicine of Nantes, France, has done much to clear up the exact nature of the electrochemical reactions involved, and has shown that the essential agent in this method of tissue cell devitalization is the ion of the electrolyzed zinc anodes, the ionic state of the nascent atoms of zinc released by the current permitting them to be driven by it into chemical union with the contents of the cells of the growth, where they lose their ionic state and combine with the cell constituents, producing new compounds that are dead and sterile.

During the years mentioned other physical agencies have been discovered and employed in cancer therapy, notably the Roentgen ray and radium, all of them having had attention at my hands. It has been only in my failures with ionization, nevertheless, that I have turned to other methods, none of the successful results illustrated and tabulated in this paper having received any other treatment than ionization, though many were previously failures under other methods.

The most recent technic adopted in the ionic destruction method is its bipolar application, in which the whole of the growth is directly included between the electrodes of the ionizing current, the electrodes yielding the ions of zinc being inserted at the periphery. This permits of the use of a more powerful current under which the zinc electrodes are quickly ionized and a large growth turned white, devitalized and sterilized in from twenty to thirty minutes, without retarding growth

structure under either local or general anesthesia. This technique has been used whenever possible since 1900 and most of the good results to be reported were obtained under it; though thirty five of the 129 patients remaining free from the disease were placed under the older, unipolar method from eight to seventeen years ago.



Fig. 2.—Ten years after operation for carcinoma of the jaw, granitic crusts.

TABLE A.
Statistics of 300 Cases of Cancer under Ionization Treatment During the Twenty Years between 1893 and 1914.

	No. Cases	Cured	Deaf.	Percent. Cured
Operable Epitheliomas	66	62	0	93.9
Cutaneous	28	23	0	82.1
Sarcinomas	2	0	0	0.0
Total Operable Cases	93	87	0	93.5
Inoperable Epitheliomas	24	17	0	70.8
Cutaneous	19	10	0	52.6
Sarcinomas	24	7	1	29.2
Total Inoperable Cases	207	42	11	20.2

Mortality per cent. after operation, 10.0; per cent. after ionization, 0.0.

Table A indicates the results of the ionization treatment of the three hundred patients with malignant growth placed under the method between 1893 and 1914. Of 31, 1893 to 1906 (other 31, 1913). The case which still existed in the period of over twenty years, most of them having been received in a condition that would now be regarded as contraindications to the method. The results have been brought down to the present moment in the case of living patients, and to the

*Read before the Philadelphia Academy of Medicine, Dec. 25, 1914.

time and nature of death of those who are known to have died in this rather long time.

The table shows that 129, or 43 per cent. of all

Of the 207 that were classed as inoperable in the ordinary surgical sense, 42 were cured, a percentage of but 20.2.

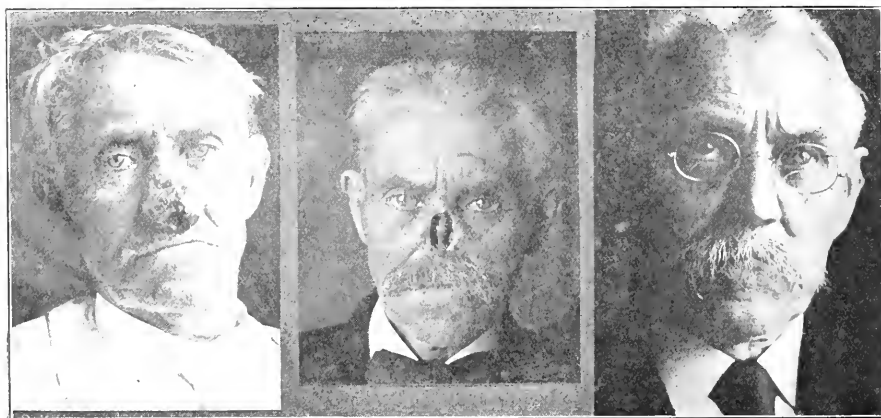
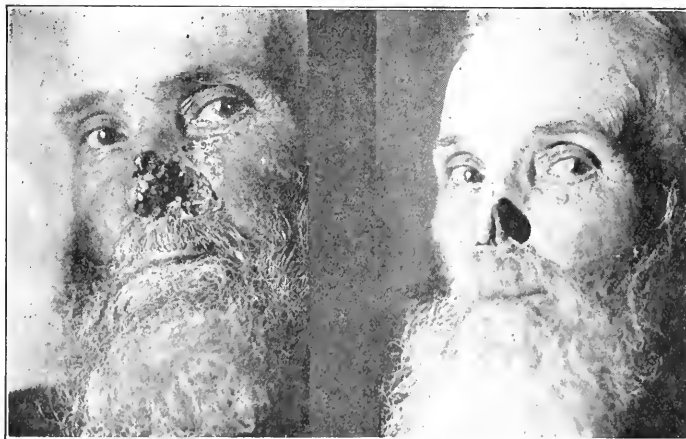


Fig. 2. Squamous cell epithelioma of nose. One bipolar major ionic operation of 200 to 700 milliamperes for forty minutes.

patients treated, have shown no return of the disease, at least 85 of which have passed the three-year period and are living at present without recurrence or metastasis, as shown in Table B. Twen-

TABLE B.	
Time Since Treatment of the 129 Patients of Table A showing No Disease	
1 patient has passed	17 years
1 " "	13 "
2 patients have "	12 "
1 patient has "	11 "
7 patients have "	10 "



September 5, 1909

Fig. 3. Epithelioma of nose.

June 18, 1910

ty-four have not yet passed the three-year point since treatment, though still free from recurrence or metastasis, and twenty have died since treatment of some affection unconnected with cancer.

Of the operable cases, a total of 93, 87 were cured, a percentage of 93.5.

12	"	"	"	9	"
11	"	"	"	8	"
18	"	"	"	7	"
14	"	"	"	6	"
5	"	"	"	5	"
6	"	"	"	4	"
7	"	"	"	3	"
6	"	"	"	2	"
12	"	"	"	1	year
6	"	"	"	less than 1 year	
20 patients have died since treatment of other affections, without recurrence.					

A great majority of the inoperable cases we recurrences after excision operations. The difficulties attending the successful application of the

growth and is apt to suggest a less extensive destruction than needed.

The mortality of 30 per cent refers to all growth

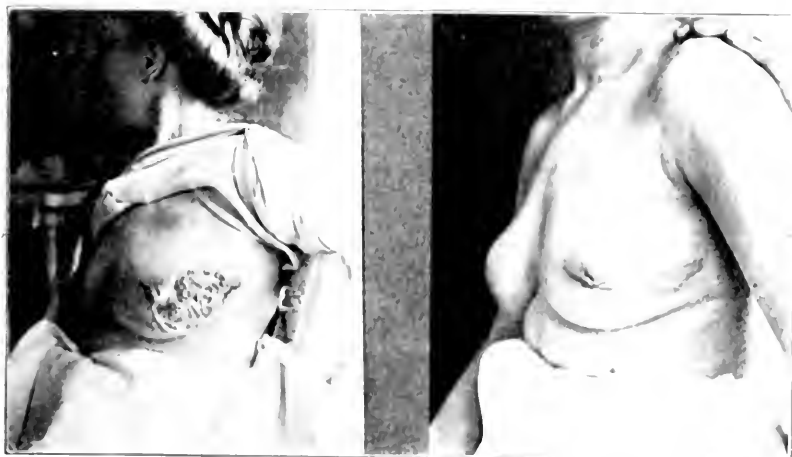


Before treatment, October 16, 1914.
Epithelioma, 4 cm. in diameter.

After treatment, December 16, 1914.
Complete removal of tumor.

method in recurrent cases are indicated when I state that but 15 of the 129 cures were obtained in patients that had been operated upon previously by

treated. As the operative deaths, mainly from secondary hemorrhage in connection with very recent growths, were confined to the 207 carcinomas and



Before operation, February 1915.
Epithelioma, 10 cm. in diameter.

After operation, April 1915.
Complete removal of tumor.

the knife. Proper prolonged treatment by the Roentgen rays, the lethal agent is a step from the point of view of inoperability, the operation, as the radiation of only the true focus of the

growth, is a rational method that would how the results to be compared.

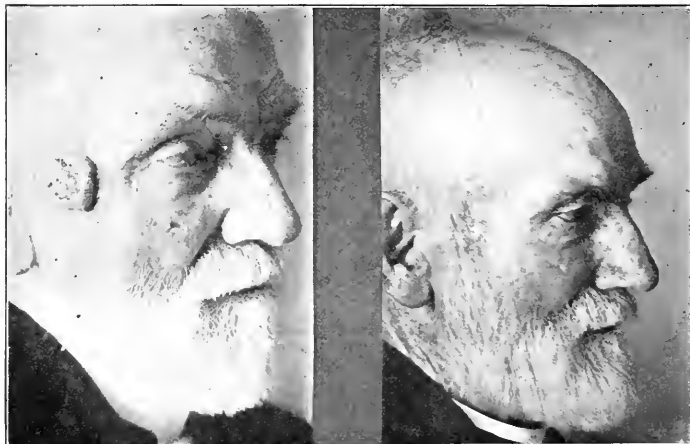
The fullness of the skin, the growths, as to the appearance of the skin, is a most

useful grouping for practical study, as one of the chief advantages of the method is its adaptability for the eradication of growths in certain confined localities, such as the nasal cavities, the mouth, rectum and axilla.

TABLE C.
SUMMARY OF 300 CASES BY LOCALITY

	Cases	Cured	Deaths
Mammary Gland	67	20	2
Face	62	49	0
Mouth	48	14	4
Cervix Uteri	25	3	1
Rectum	20	9	2

mucous membranes, whether definitely malignant or merely in the suspicious condition called "precancerous" (though, strictly speaking, a cancer must be a cancer, even in its infancy). The unipolar method is exceedingly simple, bloodless, and almost painless, and by it any physician with a simple constant current office outfit may destroy in a few minutes any small, circumscribed epithelioma of the skin, eyelids, nose, mouth, rectum or vagina. The



Before treatment, July 26, 1909

After treatment, September 6, 1911

Fig. 6. Squamous cell epithelioma.

Neck	17	3	1
Lip	9	6	0
Ear	9	7	0
Eyelid	7	7	0
Maxilla	6	1	0
Skin	6	6	0
Orbit	5	0	1
Groin	4	0	0
Nose	4	4	0
Scalp	2	1	0
Hand	2	1	0
Axilla	2	1	0
Shoulder	1	1	0
Abdominal Wall	1	0	0
Penis	1	1	0
Urethra	1	1	0
Larynx	1	0	0
	300	129	11

The diagnoses under which the cases are classified were verified in every instance, copies of the reports of pathologists corroborating the diagnosis having been found with about three-fourths of the case histories, and are in my records for inspection.

CONCLUSIONS.

My observation of the results of the ionic method in these cases, whether of cure, amelioration or failure, convinces me that it is the preferable mode of attempting immediate eradication in the following conditions:

It is an ideal method of immediate eradication of any small, circumscribed growth of the skin or



Fig. 7. Scar one year after destruction of tubular carcinoma of breast the size of a golf ball in a patient aged 74. One ionic application of 1,000 milliamperes for fifty minutes under local anesthesia.

93.5 per cent. of cures that have stood the test of years without recurrence is significant.

An extension of its value in incipient cases, particularly the bipolar technique, is the possibility of

SUPRAPUBIC CESAREAN SECTION FOR
PUERPERAL ECLAMPSIA.

B. M. RICKETTS, M.D.,

CINCINNATI, OHIO.

While deaths due to accident or disease during the pregnant state are perhaps the most deplorable, those due to eclampsia are more horrible and with a greater mortality, because two lives are concerned.

It is therefore no wonder that opinions concerning ways and means to overcome them should be at such variance. Not until a comparatively recent period in the history of dealing with eclampsia have care-takers had to offer other than therapeutic and dietetic measures, surely not surgical measures, except it be phlebotomy, the value of which has probably been underestimated, delivery per vaginam by various methods not being considered in cases after the sixth month.

The great number of deaths occurring annually due to this fulminant toxemia is sufficient within itself to excite suspicion that additional measures are necessary to overcome its ravages. It must be admitted, however, that those most interested in the subject are sorely at variance. But the squaring of the circle has been voted a possibility by a few who can locate the north star, describe the milky way, and estimate the courses and rate of speed of Halley's comet.

Enough evidence is offered in the accompanying reports and tables to change the existing angular thought to one more graceful and enduring. Though the hand of the juggler may cause the compass to vacillate for the time being, its point will eventually direct the proper course to be followed in caring for the eclamptic.

The destruction of a city of large proportions by quake and fire was necessary to overwhelm and convince the world that there is something other than the roar of cannon and the glistening of swords.

It required the loss of the newest and largest ship laden with the costliest cargo and the greatest number of human lives to change the laws governing the navigation of the high seas. It was recently necessary for five million people to be overwhelmed by the sudden inundation of their homes, two hundred thousand of which were totally destroyed, to prove the fallacy of human endeavor; and it will ever be thus.

Zinke states (*Journal of the A. M. A.*, July 26, 1913) that he has observed 30 cases of eclampsia resulting as follows: "Four mothers, 13.3 per cent., died; 15, or 50 per cent., of the children were lost." The still high maternal mortality, 13.3 per cent.,

and fetal mortality, 50 per cent., in his last 30 cases, he says, was due to the fact that two of the mothers were moribund when first seen by him; one remained in profound coma after the first, and another after the eleventh, convulsion. The third died of shock and hemorrhage following an *accouchement forcé* performed by the physician in charge of the case. The fourth died soon after the eleventh convulsion, and a comparatively easy vaginal hysterectomy performed without an anesthetic. It is not claimed that the above mode of procedure will be invariably successful; but Zinke's experience impels him to believe that in those cases in which it fails, very little could have been expected from surgical intervention. Certainly, in the presence of any condition, maternal or fetal, which makes the birth of a child *per viam naturalem* hazardous or impossible, abdominal or vaginal Cesarean section or deep cervical incisions, each depending on the period of gestation and other circumstances, is a justifiable operation. But in view of the evidence presented, it can only prove a serious error to maintain that an immediate interruption of gestation or termination of labor, by any surgical method in vogue, is the treatment *par excellence* in eclampsia. The good results obtained from strictly medical care in these cases far exceed the results accruing from all the surgical means proposed for relief from the disease.

Lutz (*Surg. Gyn. & Obst.*, p. 550, June, 1913) summarizes the following statistics of the Urban Lying-in Hospital from 1909 to 1912: 1 case of eclampsia in 107 deliveries; 24 per cent. of the eclampsia cases occurred during the puerperium; the maternal death rate was 6.7 per cent. as a whole, 9 per cent. during the puerperium and 5.9 per cent. before and during delivery. The fetal mortality was 32.7 per cent.; but, excluding the post-partum cases, this rose to 36 per cent. The customary treatment of inducing labor was followed, rather than making a vaginal Cesarean section.

The labors terminated three times spontaneously, 17 by forceps, 13 by version and extraction, 3 by perforation, and 1 by vaginal Cesarean section. Venesection, morphine, and chloral were freely used. The author advises immediate delivery in severe cases where the pulse is small and rapid, the urine scanty, and coma persists between attacks.

On August 4, 1913, St. Ann's Maternity Hospital, St. Louis, Mo., Dr. Percy H. Swahlen states that they have delivered from 96 to 117 per annum for five years with only three cases of eclampsia during that period, one coming on during labor, one

HEALTH OFFICER'S REPORT.

City.	1907.	1908.	1909.	1910.	1911.	1912.	1913.	Total.	Blank.
Cincinnati	1	8	5	6	8	8	....	36	....
Pittsburgh	....	15	8	14	30	16	....	83	....
New Orleans	....	....	....	21	30	....	....	51	30
Chicago	47	55	50	56	60	50	....	318	....
New York City	....	127	160	138	143	161	....	729	....
Boston	....	12	39	20	27	32	....	130	....
Baltimore	28	24	30	22	17	20	20	161	....
Washington	....	17	8	8	15	20	....	68	....
Cleveland	....	6	5	18	12	13	....	54	....
Detroit	13	10	11	16	15	16	....	81	....
Providence	....	13	8	16	20	10	....	67	....
Nashville	....	6	3	3	8	5	....	25	13
Indianapolis	....	4	7	2	5	9	....	27	....
Thirteen cities, total for five years	....	....	....	....	....	....	18	30	....
For the census zone only: U. S.	1,470	1,619	1,706	1,824	2,094	....	....	....	....

until full term of gestation, though it has been known to occur before the third month.

May not the exciting cause be found in the bite of an insect, the presence of a parasite entering the body by way of the mouth, anus, uterine cervical canal, or urethra, or through the cutaneous structures?

If it is more frequent during the summer months or in a latitude where there are a greater number of warm months, would it not indicate the danger of insects or parasites, which are more numerous then?

What relation does the so-called eclamptic state in the female have to the so-called uremic conditions in the male?

The presence of albumin in the urine of the pregnant woman is not conclusive that eclampsia will occur with or without one or more convulsions, especially just before, during or after delivery, or before, at, or after full gestation, because convulsions do not always occur when albumin is present to any degree; indeed, eclampsia exists without convulsions or the presence of albumin. It may, however, occur after convulsions or delivery. It cannot then be considered a cause, but it may indicate the absence of an important substance, probably urea, that should be present in the urine in considerable porportion, but which remains in the general circulatory system, both arterial and lymphatic, as the result of acute nephritis varying in degree. Though there does not appear to be any evidence indicating that even a large amount of urea is essential to produce the required toxicity, small amounts being physiologic.

This would indicate that the amount of dosage varies with the individuals, and with the general condition of the individual at a time when the toxic irritation to the central nervous system is produced, if urea be the cause. But this remains undetermined. A certain unknown fulminant toxemia is ascribed as being a cause.

Would the subjects of eclampsia having nephritis before conception have convulsions, so early in life, if they have never conceived? What rôle, if any, does an inhabited uterus play in the tragedy of

convulsions? If the presence of a living or dead body within the uterus is the exciting cause, why do not convulsions always occur with such an inhabitant?

If the exciting cause exists within the mother and not within her uterus, why does not the living occupant of the body always have convulsions? Perhaps it does. It often has after birth. Its blood is identically the same in character as that of the mother, containing the same proportion of albumin and urea, which are supposed to have been the bane of the pregnant state. Is it the poison or the condition that produces the poison that causes the convulsion?

The presence of albumin may be due to neoplasm, urea, hysteria, epilepsy, cerebral irritation, diet, cardiac or hepatic disturbances. It is therefore important to differentiate them, though the same doubt prevails with their absence or presence.

If nephritis is due to the presence of gestation, and the two are the cause of eclampsia, should not gestation be terminated immediately? Should it not be terminated abruptly if the presence of the fetus alone has anything whatever to do with causing convulsions?

Surely, the presence of one dead within the uterus would not be tolerated longer than the time necessary to remove it, in the shortest time, and with the greatest safety to the mother. If necessary when dead it is more necessary when alive, because of the possibility of saving two lives.

The many theories pertaining to the reflex disturbances offer no solution to this all-important problem.

Gestation must be terminated by natural or artificial means soon after maturity (280 days), though the legal time has been extended to 320 days, with safety to the mother and the birth of a healthy, living child. This variation in time of gestation is mentioned to refute the statements that 280 days is the legal time, but these are not exceptions in favor of delay in delivery at any period of gestation when convulsions occur. The period of gestation varies with all animals and with the individuals of every particular kind.

In the absence of any knowledge of the mother's childbearing history, stillbirths should be reported to the mother, and the obstetrician should proceed to disprove their existence, if important.

The child is delivered with placenta before or after delivery, and bleeding is profuse for several hours, as the result of trauma associated with uremia.

Anphidols have been suggested as the only important cause of a haemorrhage, but if these are they have never been observed.

CAUSATION OF HAEMORRAGE

1. Extraperitoneal stump

2. Intraperitoneal stump

Celluloheterotomies are the most common cause of the uterus with a peritonitis, and a distinction in the usual cause of a peritonitis is necessary. Infection, retention of the uterus, containing gestation at any period, is the cause of a peritonitis.

Celluloheterotomies are the most common cause of a peritonitis, and when the uterus is dead for a number of hours, it is not unusual that a peritonitis is observed. It should be determined if the uterus is dead, or the pelvis is dead, or if the uterus is dead, preventing infection from occurring. If the uterus alone will not be removed, it should be added to the ovary, and the uterus removed. If the uterus is dead, when possible, the uterus should be removed. If the uterus is dead, when possible, the uterus should be removed. If the uterus is dead, when possible, the uterus should be removed.

Intrauterine infection is the most common cause of a peritonitis, and when the uterus is dead, it should be removed. If the uterus is dead, when possible, the uterus should be removed. If the uterus is dead, when possible, the uterus should be removed.

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Date of delivery is the most common cause of a peritonitis, and when the uterus is dead, it should be removed. If the uterus is dead, when possible, the uterus should be removed.

A dead fetus is the most common cause of a peritonitis, and when the uterus is dead, it should be removed. If the uterus is dead, when possible, the uterus should be removed.

In the absence of any knowledge of the mother's childbearing history, stillbirths should be reported to the mother, and the obstetrician should proceed to disprove their existence, if important.

The child is delivered with placenta before or after delivery, and bleeding is profuse for several hours, as the result of trauma associated with uremia.

CAUSATION OF HAEMORRAGE

1. Extraperitoneal stump

2. Intraperitoneal stump

3. Anaphylaxis of the uterus

4. Multiple pregnancies after the first child

Celluloheterotomies are the most common cause of the uterus with a peritonitis, and a distinction in the usual cause of a peritonitis is necessary. Infection, retention of the uterus, containing gestation at any period, is the cause of a peritonitis.

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relief is in the direction of immediate artificial evacuation of the uterus is self-evident, and that many cases may go to normal delivery with safety to both mother and child, there can be no question. But how to classify the two will probably remain in doubt. Until that doubt is eliminated ways and means must be considered that will offer the greatest safety to both mother and child. It would therefore appear from the foregoing statements that the most rational method is offered in celiohysterectomy done by one of the various methods generally advocated.

Ambulancing. Desperate symptoms demand desperate means of relief regardless of environment. One who is drowning cares not whether he is favored with a straw or a pack of corks so long as it is the best that can be had to save his life. A surgeon should not hesitate to demand that a Cesarean section be made before manipulation of any kind is resorted to. Then, and not until then, will cases in the hands of certain practitioners have their best interests conserved. Time spent in dilating, or attempting to dilate, the cervix is wasted, and adds to dangers; such as infection, trauma, and hemorrhage incident to delay. It is to be lamented that the death of the child is given so little consideration, many operators having not made any report pertaining to its mortality.

Suprapubic Cesarean section is performed by two methods and their variations, namely (1), intraperitoneal and extraperitoneal.

Intraperitoneal, the time-honored method, remains the one of choice, and should be given preference in the greater variety of conditions demanding the immediate evacuation of the pregnant uterus after the sixth month. The transverse incision for abdominal Cesarean section was made in 1797 in Germany, but was little known until Fenestiel made it popular.

Dr. J. L. Forwood has done forty-two intraperitoneal sections for all causes in ten years. He formerly lifted the uterus out of the abdominal cavity before incising it; but he now incises it, and delivers without doing so, the hands of an assistant being utilized for grasping the lower segment of the uterus to control hemorrhage. He does not cut low down in the lower segment.

EXTRAPERITONEAL CESAREAN SECTION.

1. Lateral.
2. Median.

The lateral method has been done for many years, but has fallen into disrepute because of the very high mortality attending its doing.

The median method is of more recent origin, and

bids fair to grow in popularity in properly selected cases.

Dr. Barton Hirst, who is partial to this method and has done nine of the ten thus performed, describes it as follows:

"An incision large enough to permit the extraction of the child's head is made below the umbilicus. After making the incisions in the two layers of the peritoneum they are sutured together, which immediately closes the peritoneal cavity, making the operation extraperitoneal. Then follows the incision in the uterine wall, made in the ordinary way, and the extraction of the child's head with forceps. The lower uterine segment is sutured with double catgut; and the abdominal wall is closed in the usual way. It has been found to increase hemorrhage if the placenta is delivered from the uterine wound. It is rather better to clip the cord off, drop it into the uterus, suture the uterus, and deliver as usual. If the woman is not in labor, it is necessary to extract the placenta through the uterine wound.

Dr. John B. Deaver inclines to this method, though he believes the danger to the child to be greater.

Dr. Wm. R. Nicholson, who has witnessed six operations performed by this method, advocates it in selected cases without infection, while Dr. E. E. Montgomery states that there is no great demand for the extraperitoneal operation in the absence of infection.

Dr. E. P. Davis welcomes most heartily a method through a peritoneal fistula, though he would not employ it in the presence of hemorrhage or infection or where infection is suspected. In our experience Cesarean section is indicated in eclampsia in not more than 20 per cent. of cases. It should, however, be promptly performed if improvement does not otherwise follow.

INDICATIONS FOR CELIOHYSTERECTOMY.

After sixth month when associated with eclampsia.

In the order of their supposed frequency.

Any other condition or circumstance that would cause delay in prompt and rapid delivery.

An undilated cervix is a serious factor because of the want of uterine effort and the great danger through time necessary to dilate and deliver.

Deformed pelvis is *prima facie* evidence that the abdominal route should be selected.

A large fetal head is an indication that delivery through the abdomen should be resorted to, that the best interest of both child and mother may be conserved. This is done by shortening the time nec-

THE TRANSFIXION TREATMENT OF
FEMUR FRACTURES.*JOHN J. MOORHEAD, M.D.,
NEW YORK CITY.

Some fractures of the shaft and ends of the femur are very hard to manage when the fragments are much mal-aligned by overlapping, lateral and other displacements. In these, the ordinary methods of extension by Buck's or other apparatus frequently prove ineffective and in others the nature of the injury or the condition of the patient prevents the use of such contrivances.

At best these usual methods of treatment are not uniformly successful and often considerable shortening, angulation and other deformity persists, together with more or less stiffness of the knee and hip joints. Recognition of these unfavorable results has popularized the operative or open treatment of these cases by plating, wiring, bone transplantation and other procedures. However, these operative measures are of a major type and require a high grade of technical skill and are not uniformly successful either as to the immediate or final results. A cardinal objection is that the operative work is done in an already traumatized area which is still further irritated by the introduction of foreign bodies represented by wire, or plate and screws. Manifestly this form of treatment can never come into general use and it is now quite properly limited to selected cases under the direction of experienced operators. Between the extremes of non-operative and operative methods are devices of various sorts which are introduced at a distance from the fracture site, inasmuch as these do not invade a territory already sufficiently damaged by the initial trauma and do not require such advanced operative skill. These appliances take the form of metal pins driven into the fragments to be later separated or otherwise acted upon by braces or clamps, as in Parkhill's, Freeman's and other devices. Other modifications of this general type have from time to time appeared, all seeking the essential element of correcting vertical or lateral displacement. Various sorts of hooks and tongs have also been employed with the same ends in view. For fracture of the extremities, transfixion of the os calcis by a metal pin or rod was first suggested by Codivilla of Bologna in 1903, but Steinman of Berne in 1907 suggested transfixing nearer the lower fractured fragment by a nail and focused attention so forcibly that the title "Steinman's Nail Extension" is now quite generally ap-

plied to this method of treatment. The essential aim of the method is to obtain traction by driving a metal pin, nail or drill through the skin, soft parts and bone of the distal fragment, allowing enough of the metal to protrude on either side of the skin so that traction cords may be fastened to its side and thus lead to a pulley and weights or springs at the foot of the bed. By this means a direct measurable pull is obtained so that the fragments are gradually dragged into position by overcoming the muscular resistance. No apparatus except that attached to the transfixer is ordinarily required, aided by some form of inclined plane to keep the knee semi-flexed during the succeeding weeks of transfixion.

A variety of transfixers have been devised, some of them in two pieces, each half being separately introduced on either side of the limb; others are inserted after a preliminary hole has been made. My experience has been wholly with an ordinary steel bit or drill such as is used for boring holes in wood or metal, and this is allowed to remain in place until it has served its purpose. An ordinary "brace" has been used for boring the hole, but an electrically driven apparatus, of course, will act as well if it is not revolved too swiftly.

INDICATIONS FOR FEMUR TRANSFIXION.

1. Fractures in which ordinary methods are inapplicable or inefficient. These are usually very oblique, spiral or transverse fractures showing considerable deformity from displaced fragments in which traction on the soft parts alone is likely to prove inadequate.
2. Compound, comminuted or complicated fractures in which the parts at or near the fracture site itself cannot be interfered with.
3. Restless, delirious or otherwise uncontrollable patients; also the aged or infirm in whom decubitus might prove dangerous.
4. Old fractures showing non-union or vicious union in which recorection is made preliminary to transfixion.
5. Certain fracture-dislocations, or multiple fractures.
6. To obtain preliminary alignment prior to plating or other operative procedures.

TIME OF APPLICATION.

As soon as the diagnosis is established the treatment may begin. Preliminary measurements should always be made, and when possible radiographs should be taken in the antero-postero and lateral axes. It is not necessary to wait until swelling or other reaction subsides, and the presence of the

* Read before the New York and New England Association of Railway Surgeons, October, 1913

tures very close to the knee joint as in the supracondyloid variety, transfixion can be made through the head of the tibia, and indeed this site is advised by some as the place of election in fractures of any portion of the shaft of the femur. It has not appealed to me because of the tension imposed on the undamaged knee joint, although this appears to be a theoretical more than practical objection.

Fracture of the neck of the femur has also been treated by transfixion, and the cases suitable for the position of abduction should be very readily controlled by the procedure as the direction of the traction-pull is easily arranged.

OBJECTIONS.

1. *The bone is not completely immobilized.* This is not a real defect, as union will be firmer and quicker than if the parts were in absolute fixation.

2. *Necrosis may be induced by the drill.* This has not been caused in the cases thus far reported and the radiographs indicate no osteoporosis or other bone changes. The fact that the drill is so easily extracted would seem to indicate that the bone sought to expel the drill by erecting a barrier of osseous granulation, in effect regarding it as a foreign body.

3. *Infection is carried from without in.* This sometimes occurs in any operation, but there is nothing inherently dangerous in this technic.

4. *Lateral deformity is uncorrected.* This in a measure is true; but apparently it is not an essential element, for if the over-riding is effected the functional result will be good. Lateral traction and vertical suspension surcingle may in part correct this.

ADVANTAGES.

It is an intermediate measure between the closed or non-operative methods (Buck's Extension and the like) and the open or operative radical methods (plating or wiring). It is less hazardous and perhaps more generally applicable than plating because the procedure is (a) simple; (b) the scene of operation is at a distance from the traumatized area; (c) no foreign body is left in the tissues; (d) the parts are always exposed during healing; (e) joint stiffness is minimized; (f) atrophy, joint-stiffness and decubitus can be controlled.

It is by no means adapted to all sorts of cases and is not recommended where ordinary forms of extension suffice, nor when plating or transplanting seem more likely to be efficacious either because of the nature of the injury or the availability of a surgeon skilled in that work. It is a simple operative procedure readily performed by the average sur-

geon with a minimum of risk and paraphernalia and it can be done at the patient's home if necessary.

The transfixion feature may well be used preliminary to plating, thus obviating much of the trauma occasioned by efforts to align fragments more or less separated by contracted powerful muscles.

Sufficient time has not elapsed to learn the ultimate effect in the cases herewith reported; but thus far the results promise well and certainly the relief from shortening and other deformity is such that the method should find a place in the treatment of many fractures of the type already mentioned.

The following representative cases are reported showing radiographically the results of the transfixion and they are selected from a group of eleven cases treated since July, 1913, when the writer first began this procedure.

The cases cited from Harlem Hospital were in the service of Drs. John J. McGrath and Irving S. Haynes respectively, and the case treated at the Post-Graduate Hospital was in the service of Dr. John F. Erdman, and to these visiting surgeons I am indebted for the opportunity of treating these patients. The radiograms from Harlem Hospital were made from plates taken by Dr. W. H. Stewart. Dr. I. Hirsch made the plates in the case reported from the Post-Graduate Hospital.

Case I. John S., aged 11, was admitted to Harlem Hospital June 30, 1913, with a compound fracture of the middle of the femur due to being run over by a wagon. Transfixion was done July 3rd, and the drill was removed July 29th and at that time union was fairly firm and there was a lengthening of one-quarter of an inch. A plaster of Paris spica was worn for two weeks thereafter and it was then removed and he was sent to the country for the summer. I am told by our social service department that he has a normal-looking and acting extremity.

Case II. John H., aged 6, was admitted to Harlem Hospital July 7, 1913, with a simple fracture of the upper third of the femur and humerus due to being run over by an ice wagon. He was transfixied July 10th and the drill was removed July 29th and then a plaster of Paris spica was applied as in the preceding case, the injured thigh then showing no shortening. He was presented before the Harlem Hospital Clinical Society in October and his recovery was apparently perfect.

Case III. Peter D., aged 7, was admitted to the Post-Graduate Hospital July 5, 1913, with a fracture of the upper third of the femur due to a fall from a stoop. Transfixion was done July 11, and the drill was removed three weeks later and plaster of Paris applied as in the preceding cases. There was then about one-fourth of an inch lengthening. He has had an excellent anatomical and functional result. There is little if any inflammatory reaction about the holes made by drilling.

all forms of hernia, if not incarcerated, or, if there are not extensive adhesions between the hernial contents and sac; appendicectomy, *if performed in the interval* (when the tissues are not inflamed). But an operation for acute (inflamed) appendicitis should never be attempted under local anesthesia, for the reason that the necessary pulling and stretching of the peritoneum is extremely painful, and it is, of course, impossible to anesthetize this structure. The peritoneum can, however, be incised or burnt without causing pain. All operations upon the mammary gland, including amputation (but it is especially indicated in the extirpation of small tumors of the gland). All operations upon the

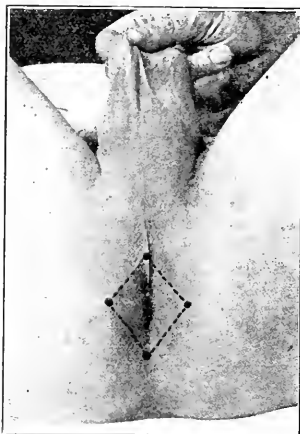


Fig. 1. Injection of the anus and rectum.

anus, penis, scrotum, and external female genitalia. For incision of abscesses, puncture of pleural exudates, rib resection, and dressing of all wounds. All operations upon the head and neck. All operations upon the extremities. In all the above operations, except those upon the extremities, infiltration anesthesia is usually employed.

INFILTRATION ANESTHESIA.

The anesthesia is produced by the injection of a one-half per cent. solution of novocaine and suprarenalin, except in operations upon the fingers and toes. Here a one-half per cent. novocaine solution, without suprarenalin, is used, with a constricting rubber band to retain the anesthetic fluid in the part.

The general technic of infiltration anesthesia is as follows: Four or more points surrounding the area which is to be anesthetized are injected by placing the point of the needle between the layers of the skin and forcing out the solution until a small

blanched spot appears. These points must be connected by an injection which is made into the skin forming a wheal, which must completely surround the area, as otherwise the injection is without value. Anesthesia is produced by bringing the solution into direct contact with the nerve endings. If no wheal is produced it means that the solution has been injected into the subcutaneous tissues and has not come in contact with the nerve endings. To produce this wheal successfully, one must use a long needle and push it forward between the layers of skin and inject the solution as the point of the needle moves forward. This continuous injection does two things: (1) It avoids putting



Fig. 2. Needle positions for the injections around the rectum.

much of the solution into a bloodvessel, should one be punctured. (2) The needle always passes through tissue that has been filled with fluid. The next step is to anesthetize the subcutaneous tissues. This is accomplished by the use of a long needle introduced at the same points that were used in the skin anesthesia. The method of procedure is exactly the same, *i. e.*, the solution is injected as the point of the needle moves forward for the same reasons as given above, except at a lower level. If deeper anesthesia is required, as in the removal of atheroma of the fascia or periosteum, the same rule is followed except at a deeper level.

This technic applies Hackenbruch's principle, *i. e.*, the nerves supplying a part come from all sides at the same level as the part supplied.

Following is an example of the technic of the anesthesia for hemorrhoid operations. The anesthetic used in this, as in most operations, is a one-half per cent. solution of novocaine and supra-

It is well to mark the location of the vein on the skin before the bandages are applied, as otherwise it may be difficult to locate.

The vein is now opened, a venous canula with two circular grooves near the distal end and a stop-cock near the proximal end is tied firmly in place within the vein and a 100 cc. syringe (Fig. 4), with a thick walled rubber tubing about eight inches long is used to force the solution into the vein. Considerable force must be exerted to force the solution through the collateral branches of the veins in the ligated section of the limb.

The solution used is one-half per cent. novocaine *without suprarenalin*. In the upper extremities 40



Fig. 5. Point of injection for brachial plexus anesthesia. (After Kulenkampf.)

to 50 cc. of the solution are injected and in the lower extremities 70 to 100 cc.

When the veins are necessarily cut during the operation they should be immediately clamped, or tied, so as to prevent loss of the solution. One must wait from five to fifteen minutes for perfect anesthesia to take place, and at any time should the distal compression bandage interfere with the operation it may be removed, for anesthesia will remain until the upper compression bandage is removed.

Venous anesthesia is indicated in all operations upon the extremities, except in the presence of senile and diabetic gangrene. When these conditions are present, plexus anesthesia may be used in its stead.

PLEXUS ANESTHESIA.

The technic of the plexus anesthesia is as follows: The patient should be in an erect sitting position or as nearly so as possible. A thin, hollow needle from three to six centimeters long is used for the puncture.

The injection of the brachial plexus is made at the point where it passes beneath the clavicle. This lies just external to the point where the subclavian artery passes beneath the clavicle.

In thin patients it is sometimes possible to see the pulsation of the artery at this point. But if this cannot be done, one places his finger near the middle of the upper border of the clavicle and the pulsation of the artery can be readily felt. The needle is now introduced at a slight angle, as shown in Fig. 5, just external to the artery and close to the upper margin of the clavicle. The depth of the plexus depends upon the amount of fat in the region, but in most cases the plexus lies from one to three centimeters below the surface.

When the point of the needle reaches the plexus, the patient will complain of a stinging sensation in the hand or arm; this sensation in the patient is the only sure guide that one has reached the plexus, and unless the patient feels it, it is almost useless to make the injection. Difficulty is sometimes experienced in locating the plexus, but, if one remembers that it lies immediately to the outer side of the subclavian artery, and moves the point of the needle slightly, it can be easily located. Should the subclavian artery or any other bloodvessel be punctured the blood will come through the needle. In this case the needle must be immediately withdrawn and introduced again, for it would be extremely dangerous to inject the solution directly into the circulation. After the plexus is located the needle must not be moved, but the syringe is attached and 10 cc. of a two per cent. novocaine and suprarenalin solution injected. The injection may go directly into the plexus or immediately around it; the result is the same.

In from one to three minutes anesthesia and partial motor-paralysis should begin to appear, and in fifteen minutes these should be complete. If, however, at the end of this time the anesthesia is not perfect and the motor-paralysis is not complete, 5 cc. of four per cent. novocaine suprarenalin solution may be injected through the needle, which has been left in place.

This anesthesia is applicable in all operations upon the hands and arms, including amputation below the level of the middle of the upper arm. Should the operation be above this point plexus anesthesia must be combined with infiltration anesthesia.

Plexus anesthesia should never be used on both sides of the body at the same time.

DEMAREE BUILDING.

a papilloma in the bronchus of a child which caused dyspnea and which was successfully removed through the bronchoscope with complete relief of symptoms. Three years ago a remarkable case came under the writer's observation. A woman, 35 years old, who had been operated upon six months previously for a large cervical gland, the pathological character of which was not definitely determined, developed shortness of breath. Her family physician was inclined to attribute the symptoms to nervousness, as was the surgeon who had operated upon her, since, whenever they saw her she was quiet and accordingly better. She insisted that her breathing was gradually growing worse, so Dr. J. J. Carroll examined her throat, but could make out nothing definite with the mirror. He then asked the writer to pass the bronchoscope. The patient was extremely nervous and, since it was before the day of straight bronchoscopy, the writer had some difficulty in passing the 5-millimeter tube. This was finally accomplished, however, and a good view of the trachea obtained. Below the thyroid gland a large tumor was seen growing by a broad base from the left wall of the trachea and leaving a small slit between the tumor and the right wall of the trachea through which the patient was breathing. The surface of the growth was nodular with numerous large blood vessels coursing over it. Since the tumor was so large and seemed so full of blood, it was thought best not to attempt removal of a piece for microscopic examination. It was realized that if interference caused serious bleeding, the patient would probably choke before anything could be done. The only method that offered any hope of relief was from outside operation. The patient was advised to come into St. Joseph's Hospital at once so that she could be constantly watched. A few days later, Dr. A. C. Harrison did a preliminary tracheotomy and shortly afterwards enlarged the tracheal wound and removed as much of the growth as was possible. He found that it extended some distance down in the trachea, and Jackson's long tracheal canula was introduced. The microscopic diagnosis was endothelioma. The patient has had several operations and is still living four years after the first operation with the aid of a long tracheal canula. She cleans and replaces the tube herself, is able to talk and seems to enjoy life. In this case diagnosis with the mirror was not possible, and it is probable she would have asphyxiated if the bronchoscope had not been used.

A woman, 62 years old, was referred to the writer by Dr. James Bordley for expectoration of

blood for some time. The patient was well nourished and nothing could be found to account for the blood. Eight months before the writer saw her, Dr. Bordley had removed the left eye for sarcoma of the ciliary body. The patient had an almost constant cough which prevented sleep. Under alypin anesthesia with the head straight, the 9-millimeter bronchoscope was passed without the separable speculum. Nothing abnormal was seen in the trachea or upper bronchi. When the terminal bronchi on the right side were reached, a fringe-like tumor was seen in one of them just where the tertiary bronchus came off. Blood appeared in this bronchus and when wiped away quickly reappeared. Unfortunately, the writer had no forceps small enough to remove a piece for microscopical examination; in appearance the tumor resembled a papilloma. In this case, Dr. T. R. Boggs had previously made a diagnosis of bronchial obstruction.

A few weeks ago a lady was referred to the writer by Dr. Bordley for expectoration of blood of two years' duration. There were no symptoms of tuberculosis and the lungs had been pronounced sound by Dr. Boggs. The blood, as a rule, would appear two or three hours after exercise such as horseback riding or dancing. The greatest quantity that had appeared at one time was about two ounces and always as clots. She had dilated veins at the base of the tongue which, after cauterization, did not stop the hemorrhage. Dr. Boggs, from the physical signs, thought there was some trouble in the left bronchus, probably a stenosis. Though the patient was very nervous, the 7-millimeter bronchoscope was passed at the first sitting, but just as the tube was about to enter the left bronchus, she became so restless it was thought best to remove it quickly to prevent possible injury. In this case the use of the separable speculum would have been absolutely impossible. The bronchoscope was passed with the head straight. The patient was given bromide of soda and told to return in a week for a second examination. After alypin anesthesia, the bronchoscope was again passed, and the bronchus examined; a narrowing of the lumen not sufficient to interfere seriously with breathing was found. No dilated blood vessel was seen and the origin of the bleeding could not be determined. In this case the small laryngoscope which was used in anesthetizing the larynx and trachea was tolerated badly, and bronchoscopy with the separable speculum would not have been possible.

Chronic bronchitis. Literature on the direct treatment of chronic bronchitis is scarce. Applica-

of the trachea was the only thing that would save his life. He finally consented to the operation and a low tracheotomy was done with the patient sitting, under local anesthesia. Just as the trachea was entered, the patient cried out that he could not breathe and fell back cyanotic and apparently dead. Jackson's small tracheoscope was forced into the trachea and through the stricture; with the help of artificial respiration and stimulation the patient soon recovered and was put to bed in good condition. That night the resident physician who had charge of the case went out, and at 11:00 o'clock the patient was cyanotic and almost dead from the plugging of the tube with blood and secretions. Dr. Devilbiss was sent for and, though he had not seen the tracheotomy and knew nothing about the case, promptly pulled the tube out and resorted to artificial respiration and stimulation, thereby saving the patient's life. A long Jackson's tracheal canula was ordered, but it was found to be too short to go through the stricture. A special tube was obtained from Pilling measuring four inches in length and nine millimeters in the inside diameter. The introduction of the tubes caused severe constitutional symptoms; the temperature would fluctuate between 102° and 104° and extreme prostration would follow. For some time the stricture was dilated from day to day without trying to keep the tube in. When the trachea became more tolerant, which happened in about two weeks after the tracheotomy, the patient was allowed to sit up. Every effort was made to find the cause of the trouble; a Wassermann examination proved negative, but on general principles two doses of salvarsan were given without any effect on the breathing. The patient could now wear his tube a part of the day; it would then have to be removed and a short tube substituted to keep the tracheal wound open. Treatment was begun March 1, 1912, and on April 1, when the constitutional symptoms had quieted down permanently and the writer was ready to begin the removal of the diseased tissue, the patient insisted on returning to his home. He was told that he should remain under treatment several months at least, but, as he was determined to go, he was cautioned to keep the tracheal wound open at all hazards. He did not do so, and two weeks later he had an attack which came near ending his life. A surgeon reopened the tracheal wound and forced the canula through the stricture; for the third time artificial respiration and stimulation saved his life. He returned to Baltimore the latter part of April to remain as long as might be necessary. Systematic treatment was immediately begun to remove the

diseased tissue. The 8-millimeter tracheoscope was passed through the tracheal wound and as much tissue as possible removed from the tracheal walls with Pfau's cutting forceps. The tissue was soft and friable and promptly returned. The operation was repeated from time to time with the same result. The high frequency spark was now tried, but without result. Repeated microscopic examinations showed always the same thing—chronic inflammation. The tissue returned so surely and so rapidly after these procedures that the writer felt like giving up in despair, when Dr. William Caspari suggested the use of pure chromic acid applications. The result of the treatment was magical; the acid, fused on the end of a probe, was applied directly to the diseased tissue through the bronchoscope. Wherever the acid was applied a yellowish slough would form which would be coughed up in a few days. Some apprehension was felt at first as to the effect of the acid when used so near the lungs, but beyond a slight burning sensation for some hours after the application, no bad effects were noted. The treatment was given once weekly and the improvement was marvelous. In a few weeks the tissue in the trachea had all disappeared and the walls were comparatively smooth with a diameter of about 12 millimeters. Just above the bifurcation there still remained a peculiar formation posteriorly which forced the end of the tracheoscope far forward to see the bronchi. The acid reduced this spot more slowly than the soft tissue above. By the first of August the trachea was in good condition and the patient was allowed to go to his home for a vacation. He had learned to take out the tube, clean it and put it back. During his stay at home he had an attack of malarial fever which put him to bed for two weeks. The latter part of September he set out to return to the Presbyterian Hospital. When he reached Washington, he noticed that his breathing was bad; he attributed this to the fact that he had had no opportunity to clean his tube on the train. On his arrival at the hospital he was in bad shape; Dr. Caspari in my absence removed the tube and gave him a hypodermatic injection of morphine, when he quieted down and had no more trouble. Late that afternoon the writer passed the tracheoscope and found the trachea and bronchi in about the same condition as in the summer. Chromic acid applications to the swelling just above the bifurcation were now resumed with the result that the lumen of the trachea gradually increased in size. About the middle of October, when everything seemed to be progressing nicely towards ultimate recovery, it

was noticed that the left bronchus was filling gradually with the same soft tissue that had given the trouble higher up. It was removed as well as possible with the forceps and chromic acid applied to the base. Healing was as rapid as it had been above; since then the bronchus has remained open and the patient's breathing is good. December 17 the patient took a short walk and returned to the hospital in good condition. One hour later he had a hard chill and his temperature immediately rose to 105.4°. Though nothing definite could be found in his lungs, all felt that pneumonia had developed and the patient was certainly doomed. The temperature began to fluctuate between 97° and 100°; one day the morning temperature was 96° degrees and in the afternoon rose to 100°. Dr. Gordon Wilson saw the patient, but would make no definite diagnosis; he advised large doses of urotropin. The patient continued to have his high temperature for two weeks longer, making a total of four weeks. His appetite failed and he rapidly wasted away. Finally when all were wondering at his wonderful vitality and speculating as to how long he could survive such temperatures, his temperature suddenly dropped to normal and remained there for two weeks, his appetite improved and he soon began to increase in weight. At the present time—the latter part of January, 1913—he is having temperature again varying from normal to 102°. He claims that his breathing is better than it has been for a long time. It is interesting to note that just about a year before this attack he recovered from pneumonia after a long illness. If he recovers from his present illness, an attempt will be made to substitute a short tube for a long one, if he breathes freely through this for a week, it will be removed and the wound will be allowed to close.

Syphilis of the trachea. In this country the severe syphilitic changes are not as common as they are in Europe. In a large number of tracheal examinations, the writer has not seen any syphilitic changes in the trachea. If gotten in time, before contraction sets in, and if the proper treatment is given, it should be as present in the trachea as in the larynx, where it can be seen in many little spots or irregular areas. It is not all well as prophylaxis, but it is a good idea to apply iodine to have the trachea "syphilitized."

Syphilis of the trachea in the past. The writer claims to have seen only one case of syphilis of the trachea in the past 17 years. In this case the patient had been ill 10 years with a severe syphilis, and had not benefited from any treatment. The trachea was

found to be almost completely closed. In this case the patient was treated several cases since that time. The writer states that the treatment must be continued in some cases, that when one has had it once in one patient, improvement followed by cure of it. The writer has cured one case of a tumor with the application of cocaine and adrenalin in the morning, while in another patient no good was accomplished. The usual treatment consists of the application of cocaine and adrenalin to the mucous membrane of the bronchi. There is no reason why argyrol and nitrate of silver could not do good in those cases in which the membrane is reddened and thickened. The treatment is justifiable in all cases of pure spasmodic asthma, since it seems to be the only means of affording relief.

The diagnosis of the cause of chronic dyspnea. Through the bronchoscope one can diagnose external pressure on the respiratory tract. If the so-called "scabbard trachea" is seen high up with the anterior wall pushed back or one lateral wall pushed over towards the other, one can safely diagnose thyroid pressure, though the gland externally may appear small. Further down the "scabbard trachea" may be caused by pressure from an aneurysm which can be diagnosed with remarkable certainty by the extreme heaving impulse at the point of constriction. One case is recorded in which an aneurysm was mistaken for a tumor of the trachea; a piece of the "growth" was removed with with biting forceps with death of the patient. In other cases a mediastinal tumor may be the cause of the constriction, and in children, especially, pressure from an enlarged thymus or a tubercle gland in the mediastinum, which usually pushes the posterior wall forward. In tumors of the trachea of small size, removal through the bronchoscope should always be tried. In malignant growths low down the same measure should be resorted to to give temporary relief.

Foreign bodies in the trachea and bronchi. Some of the most wonderful as well as the most interesting cases of tracheal foreign bodies have been seen by the writer, where the foreign body had been in the trachea for years. In some cases the foreign body was a piece of wood, in some a piece of bone, in some a piece of metal, in some a piece of glass, in some a piece of paper, in some a piece of food, in some a piece of clothing, in some a piece of jewelry, in some a piece of medicine, in some a piece of

other material. In some cases the foreign body was a piece of wood, in some a piece of bone, in some a piece of metal, in some a piece of glass, in some a piece of paper, in some a piece of food, in some a piece of clothing, in some a piece of jewelry, in some a piece of medicine, in some a piece of other material. In some cases the foreign body was a piece of wood, in some a piece of bone, in some a piece of metal, in some a piece of glass, in some a piece of paper, in some a piece of food, in some a piece of clothing, in some a piece of jewelry, in some a piece of medicine, in some a piece of other material.

by any method. In 1897, Killian removed a foreign body from a bronchus through the bronchoscope by throwing light down the tube from an electric head-light. Since then operators throughout the world have demonstrated the usefulness of the bronchoscope in this class of cases. Though many articles have appeared, it is a curious fact that many physicians and surgeons, some of them eminent, seem not to have heard of tracheo-bronchoscopy or having heard, do not take the trouble to inform themselves of its value. In this city—and the same thing doubtless happens in other cities—it occasionally happens that patients with foreign bodies in the bronchi are sent home without the removal of the object. Not so long ago, a boy was taken to a surgeon in a local hospital with the history of having a foreign body in a bronchus. A throat specialist attempted its removal through the bronchoscope, but only succeeded in pushing it two inches further down. Another specialist then tried it, but did not succeed in getting it. The patient was sent home and the father advised that the object would become encapsulated and would give no trouble in after life. In this case the foreign body, being metal, could have been removed with the method adopted by Iglauer in removing a small screw from the bronchus of a child under the most unfavorable conditions. The screw had been in the bronchus for some time, and when the bronchoscope was passed, a large pus cavity was found which prevented a view of the object. Since the removal of all the pus seemed impossible, Iglauer conceived the idea of trying to remove the screw with the giant magnet. A steel wire was passed through the bronchoscope and one end attached to the magnet. When the current was turned on a distinct click was heard as the screw leaped to the magnet. The magnet, wire and bronchoscope were then pulled away from the boy and the screw was found on the wire. In searching for foreign bodies in adults, the writer uses local anesthesia applied by means of a spray through the bronchoscope. If necessary to quiet the cough reflex, hyoscine is injected, which allows the passage of the tube with a minimum of anesthesia. In foreign bodies which are seen early, there is not much secretion in the tubes, especially if atropine is injected and there is little danger of filling up from absence of the cough reflex. In bronchoscopy it is a safe rule never to give an anesthetic if it can be avoided. The first foreign body removed by the writer was peculiar. A girl, 12 years old, was wearing a hard rubber tracheotomy tube for stenosis of the larynx. One afternoon the resident physician took the tube out to clean it and

replaced it without noticing that the canula was almost unscrewed from the plate. About an hour later as the girl was eating cake she suddenly choked and became cyanotic. The nurse was badly frightened and rushed down stairs with the information that the patient was dying. When the writer saw the girl, a few minutes later, she was quieter, but her breathing was bad. She was taken to the operating room, put to sleep, Jackson's 5-millimeter tracheoscope passed through the tracheal wound, and the tube removed from the right bronchus. The patient made an uninterrupted recovery.

In a boy, 7 years old, the bronchoscope was passed with the head straight in the removal of a grain of corn from the right bronchus. In a child, 2 years old, with a watermelon seed in the trachea, the 5-millimeter tracheoscope was passed without the separable speculum and the seed removed through it. In the methods described above the effort has been made to simplify the work so that every laryngologist can use it successfully.

It may not be amiss to refer briefly to the different methods of removing foreign bodies of various shapes and consistency. Sharp bodies such as pins, pieces of bone, etc., are better removed under general anesthesia, because of the danger of injuring the tracheal or bronchial wall with local or no anesthesia. The writer believes it is better to put older children to sleep under these conditions, while younger children as emphasized above should never be anesthetized. For straight pins any good forceps can be used to seize them. If the pin is sticking in the wall of the tube, it must first be carefully disengaged and then drawn out through the tube. Safety pins have to be carefully handled if open with the pin up. Jackson, Mosher, and McCoy have devised closers which render the pin point harmless. Jackson's instrument is very satisfactory, as is McCoy's, for small pins. A detailed description of these instruments would take up too much space. For soft objects such as bean extractors have been devised. Jackson uses an instrument which works on the same principle as the pin closer; the extractor is introduced straight, worked carefully below the bean and then by a special mechanism the end is turned to a right angle and the bean coaxed upward. Brunings has a "claw" forceps which is intended to grasp the body, but not to break it into bits as the average forceps often do. For removing buttons, special forceps are made, and Brunings has a tip to grasp a collar button a certain way. All these instruments facilitate removal of foreign bodies, and one who expects to do bronchoscopy must have at least one of each kind.

in practically every respect resembles the views held at present for acute appendicitis.

In appendicitis laparotomy promises success the first twenty-four hours (except the foudroyant forms where aid is almost always too late); that time having passed, few surgeons risk operations and wait till the stormy phenomena have subsided. After that operation is safe.

The treatment at field hospitals, therefore, will consist of rest, ice-bag to the abdomen, Fowler position, saline clysmata, etc.

Medical officers with surgical experience will realize when they see a soldier suffering from acute peritonitis that operation is out of the question, because the grave prognosis is written on the brow of the unfortunate sufferer.

But, one will say, what about these cases which do not run a stormy course, the type commonly designated as sub-acute peritonitis?

In patients "lingering" with phenomena of peritonitis, section of the abdomen has proved a most extensive adhesive peritonitis. The entire ileum seems glued together, studded with little pus pockets. While admitting that the prognosis, both as to life and after well-being is very grave, surgery can hold out no promise of relief—if anything, disaster is invited by such rash measures.

The situation is different when we have to deal with extensive wounds, such due to portions from a burst shell. Here we may see a defect large enough on retraction of the wound margins to enable us to recognize intestine or stomach. If these are extensively torn and the patient's condition is not desperate, the viscera should be gently cleansed with sterile gauze sponges and an attempt made to close the visceral defects. Usually this will be in the form of closing the stumps by an inversion suture and performing lateral anastomosis.

A sad chapter is formed by the secondary hemorrhages. A missile that struck a vessel in the liver, spleen or hollow viscera may, while it remains lodged in the abdomen, act as a tampon. After a few days or even as late as nine or ten days, when one anticipates no fatal issue, the missile may become detached and produce thereby a fatal internal hemorrhage. In such cases, if the condition is promptly recognized and aid given, lives may be saved, but usually laparotomy will come too late, the patient dying from exsanguination in the course of a very few minutes.

The situation of the kidneys being extraperitoneal, makes the study of their gunshot injuries very interesting.

External hemorrhage of the kidney, if not appar-

ent through the appearance of blood from the wound channel proper, will show itself through the bladder, thus making the diagnosis comparatively an easy one.

In internal hemorrhages, we have conditions resembling injury to other glandular organs of the abdomen, with the exception that the hemorrhage is either intra- or extra-peritoneal. The former will offer such diagnostic difficulties that one will seldom be able to locate the source of the hemorrhage with precision; in extra-peritoneal hemorrhages, however, unless the hemorrhage is very profuse, a diagnosis may not be made for some time, that is to say until the blood accumulated in the retroperitoneal space has become infected and produces the clinical phenomena of a localized abscess—suppurative hematoma.

The treatment does not differ from that discussed for the abdomen proper. In the field hospital, it would be a mistake, however, to do what has been "accomplished" at the last Balkan war; the packing of the wound and retroperitoneal space with long pieces of gauze. Such a step means inviting sepsis and death.

No surgeon will hesitate to expose the kidney and to arrest hemorrhage by suture, because peritonitis need not follow such operations. This has its application only in the event we have to deal with kidney injuries pure and simple. In the event of the peritoneal cavity having become involved—and this will be the case most freely—the problem becomes the same as if we had to deal with intestinal injuries only.

Injuries of the *ureter*, not complicating abdominal injuries, are so rare that they can be ignored. A thorough study of the available literature convinces me that ureteral injury has never been observed. Where a surgeon has surmised such an injury from an existing sepsis the diagnosis is not free from objection. It is not inconceivable that the ureters have the tendency to slip out of the path of a small caliber missile, as soon as the tissues above it are touched.

Gunshot wounds of the bladder, however, represent, as a class, a grave injury, especially when, as has happened again and again, the bladder has been secondarily involved. In a primary wound, i. e., when the bladder has been hit by a small caliber missile, and it was not distended with urine previous to injury, the size of the injury is of prognostic importance. Where, on the other hand, adjacent bony structures have been shattered and the bladder torn by the fragments, the result is a frightful one.

The problems that present themselves refer to the ability of the bladder to hold urine, to the extravasation of urine into adjacent tissues or into the peritoneal cavity and finally, whether particles of bone, if any, of unimportance have been forced into the peritoneal cavity.

An immediate diagnosis of a compressive character will scarcely be possible, especially since, owing to the intractability of the external muscles, visual methods are possible only in extensive injuries involving the abdominal wall proper.

The first thing to observe, then, is whether or not the patient can pass water per vias naturales or through a small wound (opening fistula). If this be the case, we know that the injury has not been extensive and the only thing to fear is urinary infiltration, similar to that seen in civil life, and in the absence of a fistula we may even see good recoveries.

The patient does not pass urine per urethram or through the wound channel. We introduce a catheter and obtain either a few drops of urine or blood or both or the bladder is found to be empty. We must assume in such cases that the peritoneal cavity is receiving the urine and, of course, peritonitis is sure to follow.

In the frightful conditions above referred to, when bladder and adjacent bony structures have been destroyed, the bladder injury has only secondary significance; the general injury being such as to make almost any therapy hopeless.

The therapy depends on the condition present. The patient should have his external wounds dressed aseptically at the front and sent to the field hospital with the greatest possible despatch.

Our main reliance when the patient is brought to the bladder specifically is on the catheter. Sympage of the bladder is required and, needless to say, if urine appears through the catheter, it can be repeated as often as necessary, provided the little procedure is performed with extreme care, thereby not repeating it. If the patient cannot urinate, the bladder must be drained, and this is done by noting the point of infiltration and puncturing it with a needle.

In the case of a patient who has been shot in the back, the catheter is inserted into the bladder through the rectum, and, if the patient is able to urinate, the catheter is removed and the patient is sent to the hospital. If the patient cannot urinate, the catheter is inserted into the bladder through the rectum and the patient is sent to the hospital.

If the patient is unable to urinate, the catheter is inserted into the bladder through the rectum and the patient is sent to the hospital. If the patient is unable to urinate, the catheter is inserted into the bladder through the rectum and the patient is sent to the hospital.

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We know that the catheter is inserted into the bladder through the rectum and the patient is sent to the hospital. If the patient is unable to urinate, the catheter is inserted into the bladder through the rectum and the patient is sent to the hospital.

Personally I am unable to perform such an operation should be attempted. The method described by Mirotworzen in the German literature and later in the German periodicals is the one to be chosen. The frame of this serial is too small to allow of an extensive description of surgical procedures, with which surgeons are assumed to be familiar, so I will here state that Mirotworzen has succeeded in successfully implanting ureters into what he terms the pelvic colon by suturing the ureters into the intestinal wall similar to the manner in which a tube is sutured in Witze's gastrotomy.

It goes without saying that urotropin should be administered freely as well as intestinal anti-septics.

In civil practice we have a valuable preventive agent in vaccino-therapy; in the field, of course, this method cannot be made use of.

ACUTE MYALGIA OF THE ABDOMINAL MUSCLES: A CONDITION TO BE DIFFERENTIATED FROM SURGICAL LESIONS.*

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When a careful search of the available literature in the English, German, Italian and French periods for the past eight years, reveals only three articles upon this condition it means one of several things, that the affection is a rare one, that it is more or less frequently present and unrecognized, or that it is mistaken for some intra-abdominal lesion.

It would seem strange that a condition so prevalent in the abdominal musculature should be so little known, especially with the knowledge of the prevalence of the condition in the muscles of the back.

The condition is characterized by a sudden onset of pain in the abdominal muscles, which is usually accompanied by a feeling of stiffness and tenderness.

The pain is usually described as a sharp, stabbing pain, which is often aggravated by movement.

The condition is usually self-limiting, and the pain usually subsides within a few days.

One cause of this, I am sure, is the helpful or hindering leucocyte count; and it may be one or the other if too much importance is attached to it alone. Another and more potent evil is that the appendix lies, ready at hand, to shoulder the blame of a mistaken diagnosis if the condition happens to be a right-sided affair.

I am firmly convinced that myalgias of the abdominal muscles, without underlying visceral inflammations, do occur and much more frequently than is supposed; and that it is high time that the abdominal wall shouldered some of the blame for many an innocent appendix needlessly cut off.

I do not wish to underrate the perplexity often existing in a given case; but I shall try to point out a few things that may help to place the blame, in the majority of instances, where it belongs; and this is always more apt to be difficult than easy in any abdominal lesion.

The left-sided pain brings to mind the possibility of a kidney, colon or sigmoid affection; the right-sided one to an appendicitis, typhlitis or gall-bladder inflammation or perhaps a kidney cause; more centrally and above the umbilicus, duodenal and stomach ulcers are relatively frequent while below so often exist the pelvic conditions.

How shall we go about our work of attempting to differentiate? Is it possible to show a leucocytosis in cases of myalgia not involving the abdominal walls? I have seen the total count, in a severe gluteal case as high as 11980 and 12450 with a polynuclear rise of 73 1/3% and 85%, and in a shoulder and neck case, with severe pain, a rise to 10300 with the polynuclears to 78%.

This shows that there may be a moderate or even considerable leucocytosis in a myalgia of average or severe type with no viscera beneath to obscure the actual muscle condition.

The temperature and pulse may rise considerably, varying with the degree of irritation in the affected tissues and may, if the muscle pain is a very severe one, accompanying a myositis, simulate a septic remittent type.

There seems to be, at times, some coincidence with the spring and fall seasons of this condition. The history of exposure quickly followed by the onset of acute pain may often be elicited; or previous muscle pains, located elsewhere, help to put one on the right track.

A sharp tap on the belly of the muscles or, more particularly, their tendinous attachments, excites prompt pain when often gradual deep pressure offers a mild discomfort in comparison, and this is highly significant, as an abdominal lesion usually

gives more pain the deeper and firmer the pressure. If the belly is distended and tense from a peritonitis, this of course does not hold true, but the condition then is not usually a doubtful one.

The patients do not look abnormally sick, if I may use this expression, although this is, of course, not to be too much relied upon, as intra-abdominal lesions often fail to give rise to any typical facies or attitude.

Patients may or may not have severe pain upon using the affected muscles and these are not likely to be tense or rigid, rather more painful and tender than stiff.

Rectus muscle pain alone may be elicited by placing both thumbs on the outer border of one muscle and the remaining fingers on the outer border of the other and then pressing them together (Adolph Schmidt).

In visceral diseases, as I have said, we do not elicit much pain if the abdominal wall alone is subjected to pressure, except with peritonitis.

A few abridged histories of the abdominal type may be of interest:

Case 1. A woman, aged 22, of negative history except for mild leucorrhea, was caught in a hard rainstorm April 25, 1914, and got her feet wet. She slept poorly and began to have abdominal pain that persisted for twenty-four hours; she then endeavored to get up, which caused the discomfort to greatly increase. Bowels regular. Appetite good. On April 27th she was first seen by an attending physician; she still had considerable pain and tenderness in lower left quadrant of the abdomen opposite the umbilicus. No rigidity. Morphine hypodermically gave quiet and sleep. Leucocytes, 16400; polynuclears 85.4%. Vomited once. The following day, temperature 98.8°, pulse 77. Tongue clean. No rigidity; pain much less. Leucocytes 12400; polynuclears 83.5%; lymphocytes 16.5%. A day later temperature 98.5°; pulse 72; tenderness diminishing and patient hungry. Following day (5th), no tenderness and patient out of bed. (Mount.)

Case 2. A boy of 6 who on two successive years and within twenty-four hours of playing in the snow and becoming thoroughly wet, was taken with acute abdominal pain referred to the right side. The legs were drawn up and any movement of the body caused intense abdominal distress. On the following day the pain and discomfort were about the same. (The first attack lasted about ten days; the second for several hours, and the child was then able to get up and play about.) The present attack is the third. Blood count at onset of the trouble: leucocytes 16000, polynuclears 81%, lymphocytes 16%, eosinophiles 3%. On the following day: leucocytes 21,200, polynuclears 80%, lymphocytes 20% in the morning. In the afternoon of the same day: leucocytes 18200, polynuclears 80%, lymphocytes 20%. Two days later: leucocytes

OBSERVATIONS ON LACERATED AND
CONTUSED WOUNDS.

L. SEXTON, B.S., M.D.,

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The most common wounds calling for treatment by the surgeon and practitioner in the country and smaller towns, as well as the city, are of the lacerated and contused variety, and such a radical change in their treatment and management has taken place that it may be of interest to note the present, in contra-distinction to the past methods of caring for such wounds.

These injuries are solutions in the continuity of the soft parts, produced by a dragging force or trauma, with blunt instruments, blows or tools. Infection with bacteria usually takes place at the same time the wound is produced through dust, oil, cinders, dirt and machinery grease, which are often ground into the tissue at the time. These wounds bleed less than the incised, because the vessels are torn or twisted, and the torn and irregular edges favors the coagulation of the blood. The gaping or separation from such injuries is not so marked as in incised wounds; the tissue is often crushed and pulpified. The pain from such wounds is dull, throbbing and aching if the nerve is not divided, but if pressed upon near the crushed parts the pain is continuous until the nerve is divided or released. From the above fact, contused wounds are more painful than incised wounds, but bleed less.

Shock is largely dependent upon the place of the blow, the sensibility of the patient, and the amount of crushing injury; in avulsion and crushing of bones of both limbs, as in railroad accidents, the shock may prove fatal. Healing in very slight wounds of this kind may take place without much inflammation. The separation between the tissue is filled with small coagulum, or blood clot of fibrin, which acts as nature's sticking plaster, bringing the edges together; this fibrin forms a thin scab over the wound, under which healing takes place.

The majority of contused and lacerated wounds, however, heal by second rather than first intention. The first desideratum in all these injuries is to get rid of whatever infection has been forced into the wound at the time of the injury, at the same time arresting any hemorrhage which may be present and approximating the parts as snugly as possible. It should always be remembered that reactionary hemorrhage may take place in lacerated or contused wounds when the temporary plug that stopped the vessel is blown out by reaction, or there may be secondary hemorrhage from sloughing tissue, in-

cluding the veins and arteries; hence it is important that all risks of hemorrhage from these sources be attended to at the first dressing. Hydrogen peroxide, diluted half with sterile hot water, poured freely into such wounds, with the flaps held up so that all the crevices of the wound may be filled, aids in boiling out the foreign particles of dirt and infection and at the same time acts as a good hemostatic. The use of the peroxide of hydrogen at subsequent dressing may be questioned, particularly if delicate epithelium has begun to cover the wound; all applications should be very mild at this stage of healing. After washing out the wound with sterile water, all pulpified tissue and skin that is known to be dead from lack of blood supply or comminution may as well be removed with forceps and scissors, as to be left to slough and infect the wound later.

It is proper to state here that owing to the abundant blood supply to the hands and feet that many apparently destroyed extremities have been saved by conservative surgery. The recuperative power of nature in mending these members should always be given a chance. One can amputate later if the member is destroyed, but one can never retrieve the mistake of amputating too early.

One of the means of arresting hemorrhage from these wounds is by pouring an abundant supply of hot water into the wound, which flushes out the foreign bodies driven into the wound, and constricts the bloodvessels. If these crushed wounds are over bony prominences, compression is better for arresting hemorrhage than by putting in unnecessary ligatures which increase the risk of infection. Sterile gauze pressed into the wound as a compress or held with firm pressure under digital compression, checks the average bleeding and pain within a short space of time. Where a larger artery is concerned a ligature or suture is required. Fingering in the wound, or further traumatizing the tissue, should not be allowed. Hemostatic forceps and torsion will help to control the smaller vessels better than ligatures, which might carry infection. Chemical styptics have no place in the arrest of hemorrhage in these wounds, as they destroy all chance of union by first intention by the introduction of a foreign body into the wound, so they are only mentioned to be condemned. Their use may be permitted upon malignant or sloughing wounds.

The treating of all non-operative wounds resolves itself into not only cleansing the wound, but fixing the cells and epithelium, and cleansing as well the tissue adjacent to the wound, not by washing and scrubbing with strong soaps, as formerly done, but by wiping (rather than washing the wound) with

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WALTER M. BRICKNER, M.D., Editor

NEW YORK, SEPTEMBER, 1914.

WHAT WILL SURGERY LEARN FROM THE PRESENT WAR?

The European war is drawing to its field and base hospitals famous surgeons of their respective countries (thus von Eiselsberg is surgeon-in-chief of the Austrian army and Bier, of the German army), and many other medical men whose names are less widely known or known not at all. That the opportunities of the great conflict will make the reputations of some of these men is to be expected. That they will develop among them an Esmarch or a Jonathan Letterman is quite possible. But that the experiences of these battlefields will provide no important contribution to surgery itself is also at least likely.

The surgical annals of the Boer war make vastly different reading from the medical and surgical history of the Civil War, for example, with its grim records of amputations and hospital gangrene; and the camp sanitation and field hospital work of the Japanese in 1904 were, likewise, vastly better than those in our own army in the Spanish-American war only six years earlier. But to-day military hygiene is standardized and well-nigh perfect, and the behavior and treatment of wounds by modern missiles are quite well established. The character of these missiles has not been changed, as far as we

know since the Turko-Italian and the two Balkan wars. It would seem, therefore, that the surgical experiences of the present great war will differ in volume, rather than in kind, from those of the other all too frequent wars of very recent years. It is perhaps in the opportunities to apply our newer methods in vascular and intrathoracic surgery that the most fruitful opportunities will develop.—W. M. B.

THE MEDICAL RESERVE CORPS OF OUR ARMY AND NAVY.

At this sad time where one after another of the great nations of the earth is being drawn into the vast conflict of arms, it is comforting to us, unfettered by entangling alliances, to feel that two broad oceans separate us from the battlegrounds of Europe and of Asia. Since we settled our own internal differences a half century ago, we have engaged in but one short war and that in a spirit of altruism. But the shadow of war has fallen upon us several times. It is but a few weeks since we were held back from the very edge of war by the calm determination and wisdom of our executive. It is but sixteen years since we were actually engaged in a war that unexpectedly brought us an Oriental possession which, in the present situation, must perforce give us some concern. Even now we have a military force along our Texas frontier and our army and navy recently took possession of a foreign city where some of our marines were killed in a miniature battle. And so this peace-loving and essentially unmilitary nation may some day again feel obliged to resort to the same genteel argument that the other highly civilized nations employ, with no diminution of frequency, in the settlement of their disputes.

We abhor the militarism of Germany, we deplore the necessities that put its burden on the people of that country; but we cannot fail to admire the detail-perfection in all the departments of that huge military organization which, by instant magic, placed it, fully equipped and active, on two frontiers! To the extent that we make preparations for possible war those preparations should be just as complete and perfect. It is, however, only the preparation of the medical arm of our military forces that concerns us in these pages. To meet the necessity for a rapid enlargement of our army medical organizations, Congress some years ago created a Medical Reserve Corps of the U. S. Army (on the active list in which all prospective officers of the Medi-

cal Corps must now serve for a year or more, and subsequently it established a similar corps for the Navy.

At first there were appointed to these reserve corps men distinguished in medicine, but many of them, physically or otherwise, unfit for active service. More recently the requirements for admission to the corps have been applied more rigorously, and of the approximately 1,400 now commissioned in the Army Medical Reserve Corps, there are very many young and active men. The obligations of the commission, except in honor, are not as binding for service as commissions in the regular corps, and not all of those in this reserve could be counted upon in time of need. Of the many others, however, who would answer a call for their services, there are only a few who, beyond their civil experience, have any training whatever for the work that would devolve upon them. To be sure, in active service many of the reserve corps would be used at hospitals in large cities, at recruiting stations and in concentration camps, but others would probably be needed at the front where field service and camp sanitation would involve altogether unfamiliar duties.

The War and Navy Departments have thus far done very little to train these reserve forces in the work that active service would throw upon them. A small beginning has been made, however. In the veteran campment at Gettysburg a year ago two dozen of the army medical reserve corps were on duty and had a valuable lesson in the rudiments of camp sanitation and field hospital management. An equally small group enjoyed a similar opportunity this year as guests, in the camp of the Third Field Artillery at Holtzman, Pa., where, from June 27 to July 4 they were under the tutelage of Majors H. L. Galbreath, the chief instructor, E. L. Parsons and John H. Allen.

The first routine of military life, the lectures and actual field work from early morning until sundown, the experience of long marches, the unspeakable heat, the military atmosphere, the mingling of all social classes of the United States who knew how to conduct themselves with military exactness, all were indeed a valuable lesson. But the only real field instruction came from a handful of the corps. In the emergency they were fitted for what they could do, and that was to call their own names and to do their own work, and to call for help.

THE ANESTHESIA SUPPLEMENT

The interest aroused by the "Anesthesia Supplement" of the *Journal* is a 32 page supplement devoted to anesthesia. It can be said to be a warm welcome to those who are about to put forth as a model compliance to medical journalism. There is no one else to whom this interest is by no means limited to, pediatricists in anesthesia.

The first issue of the supplement, which will appear with our next, October, issue, is to contain the following contributed articles: "The Relation of Anesthesia to Acidosis," by George W. Crile, of Cleveland; "Insulation Anesthesia," by E. W. Nagle, of Montreal; "A Physiological Consideration of Surgical Shock," by Prof. L. W. Pike, of Columbia University; "Local Anesthesia in Hernia Operations," by James L. Mitchell, of Washington, D. C.; "The Treatment of Post-Operative Shock," by Prof. Charles Fick, of Columbia University; "Prophylaxis of Post-Anesthetic Vomiting," by H. Warren Puddler, of Baltimore.

Those thus far chosen to be associated with Dr. F. H. McMechan, of Cincinnati, in editing the *Anesthesia Supplement* are: Prof. Yandel Henderson, of Yale University; Charles K. Teter, of Cleveland; James T. Gwynne, of New York; Willis D. Catch, of Indianapolis; Wm. H. DeFord, Des Moines; F. L. McKesson, Toledo; Isabella C. Herby, Chicago; Arthur E. Hertzler, Kansas City, and, in London, England, Dudley Wilmet Buxton and John Desmond Mortimer, all of them prominent as anesthetists or as investigators of the problems associated with surgical anoxia and with shock. (J. M. B.)

Surgical Suggestions

In plastic surgery, as in any other medical or surgical specialty, it is worth a little extra effort to be more, if possible, the most complete and efficient.

A complete knowledge of anatomy, physiology, histology, pathology, and the principles of surgery, and a thorough understanding of the principles of plastic surgery, are essential to the successful practice of plastic surgery.

The first step in the study of plastic surgery is the study of anatomy, physiology, histology, pathology, and the principles of surgery. The second step is the study of the principles of plastic surgery. The third step is the study of the principles of plastic surgery. The fourth step is the study of the principles of plastic surgery. The fifth step is the study of the principles of plastic surgery. The sixth step is the study of the principles of plastic surgery. The seventh step is the study of the principles of plastic surgery. The eighth step is the study of the principles of plastic surgery. The ninth step is the study of the principles of plastic surgery. The tenth step is the study of the principles of plastic surgery.

Surgical Sociology

Ira S. Wile, M. D., Department Editor.

SOCIAL SERVICE AND DISPENSARY ABUSE.

The problem of dispensary abuse is constantly recurring, and various means have been suggested for its elimination. Societies interested in medical economics have repeatedly suggested plans for alleviating abuse with the basic idea of safeguarding the welfare of the medical profession. It is unfortunately true that most dispensaries, in their theoretical value, are organized for the benefit of the public rather than for the extension of clinical practice to physicians and surgery. Philanthropy, not education, has been their underlying motive. The financial saving represented by dispensary treatments has never been determined with any approach to accuracy. Such figures as those presented by Fussell, of Philadelphia, merely approximate the vast extent of dispensary care afforded in large municipalities.

At the Lakeside Hospital, in Cleveland, the social service department is being utilized for the purpose of curtailing dispensary abuse. Under the plan there in operation, patients admitted for treatment are divided into four general classes: (1) Those who are without funds and unable to pay for treatment. (2) Those without funds for the immediate complaint for which treatment is desired, but who possibly may be able to pay for future illnesses. (3) Those admitted for special examinations or for major or minor surgery. (4) Those admitted merely for special examinations or who come because of dissatisfaction with their own physicians or because they cannot afford a specialist, etc.

The entire control of admissions to dispensaries should be in the hands of the social service department. This would guarantee to an extent, not now possible, the proper regulation of admissions on the basis of social, medical, and economic necessity. The ethics of the profession are then far better conserved and there is less likelihood of dispensary abuse by physicians in and out of dispensary, as well as on the part of the patients themselves. By combining the admissions and the follow-up work under the care of a single social service department, greater unity is produced. There is some reason to believe that the actual work accomplished is of greater social benefit and there is less chance

for exploitation of the dispensaries and the attendant physicians by those fully competent to employ the services of regular practitioners.

The mere fact that the State laws define the type of persons who are entitled to dispensary privileges is no guarantee that the law is being carried into effect by the dispensary authorities; nor indeed is the general public cognizant of the wording of the law. Furthermore, the strict interpretation of the law would frequently cause manifest injustice to individuals really deserving special service from dispensaries on the one hand, and on the other hand, it might operate to cause deceit and irregular methods of securing dispensary service on the part of the unscrupulous, the undeserving, the dissatisfied, and the avaricious.

Undoubtedly, there are many objections to placing all problems of admission into a social medical service. Inasmuch as the social service department is organized for the social betterment of the dispensary, it becomes a legitimate function of this department to consider this phase of dispensary administration. Such organization would probably protect the dispensary from abuse to an extent that is impossible under the present form of organization, while at the same time it would insure fairer dealing with the poor, the ignorant, the suffering and the deserving persons who seek the benefits which are possible for them only in a dispensary.

THE WAR OF RACES.

Swords are again unsheathed and the boom of cannon has aroused the patriotic spirits of civilized Europe. The shell of peace on a pretext so slight as to seem almost insignificant has given way to the hell of war. The trial of our wonted civilization was at hand and the vandal spirits overcame the spiritual tendencies and commercial stability, educational progress and international friendships. Surgery, disease, invalidism, pensions, poverty, crime and desolation will follow the trail blazed by the vast armies now engaged in international conflict.

The tests of modern sanitary science were made in the Russo-Japanese War, but the wide field of comparison of the methods of nations is now open to view. The systematic study of military hygiene together with the organization of medical departments for prompt administration in field and base hospitals should evidence splendid results in the protection of the conditions affecting the soldiers.

The great distress of the war will not be the

Diseases of the Rectum and Colon and Their Surgical Treatment. By JEROME M. LYNCH, M.D., Professor of Rectal and Intestinal Surgery, New York Poly-clinic; Attending Surgeon, Cornell Dispensary; Fellow of the American Proctologic Society, New York Gastro-Enterological Society, etc. Octavo; 383 pages; 228 engravings and 9 colored plates. Philadelphia and New York: LEA & FEBIGER, 1914. Cloth, \$5.00, net.

This work commends itself by its systematic arrangement; by the modernity of its viewpoints, sustained throughout; by the author's careful attention to minutiae in the descriptions of operations, manipulations and examinations, and by the unusually fine photographs and colored plates by which it is embellished.

There is very evident a conscientious effort by the author to produce an enduring work, in which, however, he has fallen short in several respects. His style of writing, though sufficiently clear, is colloquial and occasionally ungrammatical. He seems too inclined to agree with everybody and the reader is often left in doubt of Lynch's own opinion and of the relative merits of various explanations. There is, too, much needless repetition, and, we think, too much mention of doctors who have referred cases to the author, and of private clinics where operations have been performed.

First editions of medical text-books are apt to display faults, however, and we doubt not that a second edition of Lynch's in many respects excellent work will see the shortcomings of the first issue corrected.

A Treatise on Diseases of the Rectum and Anus. Edited by A. B. COOKE, A.M., M.D., assisted by nine collaborators. Octavo; 619 pages; 215 illustrations in the text and 21 full-page plates, 7 in colors. Philadelphia: F. A. DAVIS COMPANY, 1914. Price \$5.50.

This work, in great part written by the editor, has a far wider scope than the books on the same subject that have appeared within recent years. While the essential proctologic conditions receive ample consideration, it is pleasing to note that the dictum of the editor, namely, that "the first requisite is to realize that we have to do with a patient, not merely with a rectum," has been fully appreciated by the collaborators. One chapter on rectal pathology due to extra-rectal causes, and another on the relation of rectal diseases to the general health, serve to illustrate the broad, modern viewpoint of the editor and at the same time to enhance the value of the work. The latter will, it is hoped, be further promoted in the future by a more careful survey of the broader surgical and pathological literature on the one hand, and by the elimination of a great deal of the purely didactic quotations on the other hand.

The Treatment of Neurasthenia. By DR. PAUL HARTENBERG. Translated by ERNEST PLAYFAIR, M.B., M.R.C.P. Duodecimo; 283 pages. Edinburgh, Glasgow and London: HENRY FROWDE AND HODDER & STOUGHTON, 1914.

Hartenberg distinguishes "neurasthenia" from many of the conditions with which it is usually confused, such as phobias, impulses, hypochondriasis, anxiety neuroses, etc., although he admits that there are frequent complications of neurasthenia. The author correctly views neurasthenia as a state of general asthenia, psychic and physical, and among the more important exciting causes mentions over-work, chronic infections, digestive disturbances and emotions. Hartenberg realizes the important hereditary element as a predisposing factor, but it is rather disconcerting to find our old friend, "arthritic auto-intoxications," whatever this may mean, seriously discussed as a predisposing cause of neurasthenia. Freud's theories play no rôle in the causation or treatment of neurasthenia. Hartenberg's treatment in the main consists of psychotherapy of the Dubois variety, drugs for symptomatic purposes, electricity, hydrotherapy and rest. The Weir-Mitchell treatment as a consistent therapeutic policy is not mentioned. The book has a strong personal flavor, bordering upon the egotistic. This is so prominent in many places as to be irritating. The value of the work is marred by the absence of an index.

Medical and Surgical Reports of the Episcopal Hospital in Philadelphia. Volume II. Philadelphia: W.M. J. DOMAN, 1914.

This volume consists in a compilation of the various diseases treated and operated upon in the hospital, and a number of papers by its staff, based on the hospital's material. The paper by E. J. MORRIS, physician to the institution, is a very interesting commentary upon its growth between the year 1888 and 1912. From Frazier's paper, a review of 156 consecutive operations, one learns that there is a great diversity of surgical material at the Episcopal Hospital, and that the results of surgical treatment are excellent. Most of the papers have been published in other medical journals.

On Dreams. By PROF. DR. SIGM. FREUD. Only authorized translation by M. D. EDER. From the second German edition. With an introduction by W. LESLIE MACKENZIE, M.A., M.D., LL.D., medical member of the Local Government Board for Scotland, etc., etc. Duodecimo; 110 pages. New York: REBMAN COMPANY, 1914.

To those interested in Freud's theory of psychoneuroses, this book should prove of profound interest. It is well known that the interpretation of dreams, according to the analysis of Freud, forms the keynote to the elucidation of the cause of the psychoneurosis, so that a proper understanding of this subject is highly necessary. It is gratifying, therefore, that this essay, one of the most important and one of the most difficult to read in the original language, should be so ably translated for English readers.

Diagnostische und Therapeutische Ratschläge für den Gynäkologischen Praktiker. (Diagnostic and Therapeutic Hints for the Gynecological Practitioner.) By DR. ROBERT ASCH, Berlin and Vienna: URBAN & SCHWARZENBERG, 1914.

This small brochure is intended to give the practitioner doing gynecologic work practical hints as to the diagnosis and therapy of the more common ambulatory ailments.

Progress in Surgery

A Résumé of Recent Literature.

Ovarian Pain Due to Coitus Interruptus. (Coitus Interruptus als Ursache von Ovarialgien.) A. HERZFELD, New York. *Zentralblatt f. Gynäkologie*, May 9, 1914.

Herzfeld, on the basis of observation of several cases, has noted that when *coitus interruptus* has been practiced for some time, women begin to complain of pain during the act and subsequently feel the same kind of pain in the ovarian regions on bimanual examination. The pains radiate toward the back or toward the appendix. Properly directed treatment brings about an amelioration of the pain very promptly.

Placenta Previa and Its Treatment. PROF. W. NAGEL, Berlin. *Surgery, Gynecology and Obstetrics*, July, 1914.

Nagel considers the various methods for the treatment of placenta previa, abdominal Cesarean section, the extra-peritoneal Cesarean operation, Dührssen's vaginal Cesarean method, metrecrystis and vaginal tamponade. He himself favors the Braxton-Hicks method of version and reports fifty favorable cases. He performs bipolar version as early as possible when only one or two fingers can be admitted, and brings down a foot, not distinguishing between the anterior or posterior, but seizing the most accessible one. When the os is only partially dilated, the leg must not be pulled down further than to above the knee, which will be sufficient to check bleeding. Should hemorrhage subsequently occur, when the os has become more widely dilated, the foot may be drawn down slowly until plugging is again complete. The expulsion of the fetus is left to nature, and an extraction is only justified when the os is fully dilated and the child is still alive.

tom. Constipation was marked in every case; except in four or five cases the babies were emaciated and in all there were the characteristic peristaltic waves of the stomach and the pyloric tumor was present. Beginning with the eighth case aspiration was a routine measure and in each stomach from one-half to four ounces retention three hours after feeding was regularly found. The operation showed the pyloric tumor without other lesions or malformations. With regard to the operation a few points are mentioned. "Either should be the anesthetic used. The abdominal incision should be from one-half to three-quarter inch to the left of the median line. The reasons for this are twofold: In the first place there is so little subcutaneous tissue in these babies that there is difficulty in obtaining union in the median wound, whereas the incision through the rectus muscle heals much more readily. Many post-operative deaths have followed evisceration resulting from non-union in these cases. The second reason for placing the incision to the left of the median line is the avoidance of the round ligament of the liver. At necropsy in one of our fatal cases, a large hemorrhage was found just where the needle used in closing the abdominal cavity had punctured this ligament." A partial pyloroplasty performed in some of these cases consisted in making an incision one inch long through the peritoneum and circle muscle-fiber down to the mucosa. The edges of the wound gaped widely and the mucosa protruded. No effort was made to cover or close the incision, which immediately relieved the obstruction. Gastro-enterostomy should be the operation of choice, however, where the condition of the child is even fair and the partial pyloroplasty be reserved for cases where haste is the first need. It involves a risk to the mucosa and its future is uncertain. The after-care is extremely important and much depends on the judicious use of stimulants and the proper use of fluids by hyperdermodysis and the Murphy drip, though these are not necessary when the patient is operated on when in good condition. From Downe's experience he feels justified in offering the following conclusions: "1. Hypertrophic pyloric is congenital to the extent that there is an increase in the thickness of the circular muscle-fiber at the pylorus. The presence of this thickened muscle-fiber reduces the lumen of the pylorus, and, therefore, the stomach, in order to empty itself, contracts more forcibly than normal. This abnormal contraction soon causes the mucus membrane to become thickened and edematous, and to assume a more or less spiral arrangement as it passes through the narrowed pyloric channel of from one-half to three-quarter inch. The result is a valvular action which gradually produces complete closure of the pylorus. The question as to whether or not the pylorus will admit a probe or catheter at operation or necropsy is of little consequence when weighed against the clinical evidence of complete obstruction. 2. There can be no doubt that there is sufficient time between the onset of symptoms and the appearance of the signs of complete obstruction, for careful observation and the carrying out of any medical measures likely to prove of benefit, provided, of course, that the early symptoms have been properly interpreted. The fear, however, that the condition may have existed longer than has been suspected, and that the vitality of the baby is not so good as appearances would lead us to believe, makes me feel that operation is indicated in every case of hypertrophic stenosis as soon as the diagnosis is made. Should depression or early evidence of shock be present, immediate operation is demanded. 3. The babies coming to operation in good condition suffer little or no shock; their convalescence is straightforward, and they are at once restored to normal health. My experience in this respect corresponds with that of other operators."

Induced Pneumothorax. E. A. ADELUNG, *Oakland, Cal.*
Journal of the American Medical Association, June 20, 1914.

Adelung reviews the history of artificial pneumothorax, described by Forlanini and Murphy, and describes the apparatus and technic. The manometer is the guide to the work. He gives his own experience. The benefits of the operation are not always apparent at first, and symptoms may become temporarily aggravated; but after a few weeks the good results appear, as physiologic rest has been obtained. Pain from the operation is sometimes unavoidable

on account of the tension of lesions and the displacement of organs, but it is rarely of long duration and it is best minimized by gradual increase of pressure. Subcutaneous emphysema results from too much positive pressure. The spring pad hernia truss is often useful in alleviating it. Bleeding from the opposite lung is rare. Puncture of the lung is to be avoided, though it commonly causes little or no trouble. The most important accidents are pleural reflex and gas embolism, but only few deaths have been recorded. The distinction between the two is not clear, and some authors consider them to be identical. Clinically pleural reflex and gas embolism yield the same syndrome; fainting, pallor, convulsions, perhaps temporary or permanent paralysis and occasionally death. The Bauer incision seems to be, to some extent, a safeguard, and Saugman and some others aspirate before turning on the gas to see whether or not the needle is in a blood-vessel. Von Adelung says: "My conviction is that air embolism and real pleural reflex, such as results experimentally from the injection of irritating fluids into the sac, are both to be avoided by using warm, moist nitrogen, careful local anesthesia of the pleura and proper observation of the manometer. Not until the latter records free oscillations with persistent negative mean pressure can one feel sure that gas may be introduced safely, unless one is using the open method." There is much difference as regards cases appropriate for induced pneumothorax. Hemoptysis is controlled by the method and high temperature is not a contraindication. Natural pleural effusion acts the same way, but a small one may be aided by adding gas, thus inducing more complete lung rest. All writers agree that laryngeal tuberculosis is not a bar to the treatment. Pleuritic adhesions, if extensive, are a serious mechanical hindrance to the method. If slight, they may be broken down by gas pressure, if carefully applied, and perhaps sufficient free pleura may permit its use. If the patient is already dyspneic, unless it be due to a toxin, pneumothorax is irrational. Military tuberculosis is regarded as a contraindication, and so are serious cardiac disorders and marked splenomegaly. The main discussion is on how early artificial pneumothorax should be performed. Most writers advise it only in moderately advanced unilateral cases, but von Adelung thinks that careful study of the individual case should be advised. He follows Murphy in advising it in cases in which there is no absolute contraindication, and says that when it does not cure it often alleviates. He says: "My experience is limited to forty-two cases, all but one bilateral and well advanced. All but one were ambulant, the patients coming to the office for treatments. Of the forty-two cases it is noteworthy that pleuritic adhesions prohibited pneumothorax in only five. The total number of punctures done was over 614, and no gas embolism occurred; but pleuritic effusion supervened in six cases, one being purulent. Twenty-two patients gained weight and eleven lost weight, this observation being unrecorded in four cases. In thirty-seven cases in which a pneumothorax, even though small, was possible, twenty-eight patients were improved in varying degrees, one case was arrested (perhaps cured), and ten remained unimproved."

Compound Fractures. W. L. ESTES, *Bethlehem.*
Journal of the American Medical Association, June 13, 1914.

Estes bases his remarks on the subject of compound fractures of the extremities on the following postulates: "1. In civil practice a compound fracture is always not only a solution of the continuity of a bone, but also a lacerated wound of the soft tissues in continuity from the periosteum to, and including the skin. 2. Violence necessary to produce a compound fracture of the bones of an extremity must be very great; hence the traumatism is extensive. Commonly the bone is comminuted and the laceration of the soft tissues very severe. 3. Compound fractures are practically always infected wounds. 4. The management of these injuries must include the treatment of a fractured bone and the treatment of a more or less extensive infected lacerated wound of the soft tissues of the same area." The general condition of the patient as well as the injury must be considered and the treatment should be adapted to the circumstances of each case. Stimulants, exclusive of alcohol, and analgesics are needed as well as:

[illegible]

The Value of Hexamethylenamin as an Internal Antiseptic in Other Fluids of the Body Than Urine

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1. Flexion of the leg - the knee joint is flexed, the foot is raised and the leg is bent at the knee joint. This movement is performed by the contraction of the hamstrings and the quadriceps muscles.

Hexamethylenamin

With the exception of the *Chrysomelidae*, the *Curculionidae* and the *Chrysomelidae*, the *Chrysomelidae* are the most common and most diverse group of beetles in the world. They are found in all parts of the world, and are particularly common in the tropics. They are found in all parts of the world, and are particularly common in the tropics. They are found in all parts of the world, and are particularly common in the tropics.

Cause and Prevention of Pythium Abscesses and Furunculosis

1914

Prunus Ani 15

On the Possibility of Making a Collateral Excretion Channel by Interglandular Anastomosis Between the Parotid and Submaxillary Glands.

Painless Tumors of the Spinal Cord

tirely absent while the other symptoms are typical of spinal cord tumor is, he says, no longer open to question, and he reports a case which on account of its painlessness had long been regarded as one of Pott's disease. It was one of intramedullary sarcoma of the lower cervical and upper dorsal cord, of three years' duration. Laminectomy was performed, but the tumor could not be removed. The surgical recovery was perfect. Another case illustrating the fact that spinal cord tumors may escape diagnosis on account of the long intervals in which the pain symptoms are absent, is also reported. The lesion was in the cervical cord and had existed for eight or nine years, the motor symptoms gradually progressing, but the pain symptoms intermittent. Death followed operation. A third case of extramedullary psammoma of the upper dorsal cord, with no characteristic pains and with surgical recovery after the removal of the tumor, and still another one of intramedullary perithelioma of the dorsal cord, likewise without the characteristic pain, are also reported, and still others are mentioned. Bailey calls attention to the importance of early laminectomy in such spinal cases without waiting for the appearance of the characteristic pain referred to the site of the lesion. If this is neglected too long, as it was in some of the cases reported, the opportunity of giving relief may be lost. Out of twenty-four laminectomies performed in the Neurological Institute during the year ending November 30, 1913, there was only one death from the operation. In this it was performed for a suspected tumor of the cervical cord, a very risky location. In view of this slight mortality he feels less hesitation in recommending a more general resort to the operation.

Malignant Tumors of Bone. A new method in conservative operative treatment. PROF. R. WENGLOWSKI, Moscow. *Lancet*, May 16, 1914.

The present "conservative method of treating malignant tumors of the bones is by resection in continuity and replacement by pieces of living or dead bone. Wenglowski modifies this principle by merely removing the tumor in the soft parts and killing the affected piece of bone by the aid of steam. This is done by attaching a perforated metal tube to an autoclave or an ordinary steam kettle and applying the steam directly to the bone for varying times. The author has found by experiment that to heat the tibia to a temperature of 75° to 80° C. long enough to kill all cellular elements, three minutes are sufficient; for the lower mandible, one and one-half minutes; the femur, eight minutes, etc. To protect the surrounding soft tissues, the author covers them with gauze, a metal plate, and asbestos. To heat the posterior aspect of the bone, the author has devised a special curved flat tube. The advantage of this method over that in use at present is that the continuity of the bone is preserved.

Pseudarthrosis Produced by Interposing Sheet Silk and Bayberry Wax. R. O. MEISENBACH, Buffalo. *The American Journal of Orthopedic Surgery*, 1914, No. 2.

Although a preliminary report based on few cases, the article should be reviewed because it suggests a possible solution of the treatment of ankylized joints. Fine China silk, impregnated with bayberry wax (after its preparation by the Lange method for silk tendons) is interposed between the joint surfaces after the necessary operation for their separation has been practiced. The silk is merely employed as a support for the wax. Bleeding from the bone is controlled by the same wax. The object of the author's technic is the interposition of a permanent, non-irritating, fatty material. Of the four cases reported, the results are good in two, and the other two are still under observation.

Paravertebral Conduction Anesthesia. *Die Paravertebralen Leitungsanästhesie.* P. W. SIEGEL, Freiburg. *Deutsche Medizinische Wochenschrift*, July 9, 1914.

Selheim and subsequently Laewen, Finsterer and Kappeler demonstrated the practical possibilities of inducing anesthesia for abdominal and pelvic operations by injection

of the anesthetic fluid into the sensory nerves at their exits from the intervertebral foramina. Siegel now reports 170 gynecological and obstetric operations in which paravertebral anesthesia was practiced, and describes the technic of administration, the indications and sequelae. In 70 per cent of his cases the anesthesia was sufficient; in the remainder a minimal amount of inhalation anesthesia was necessary. Any post-operative effects that were encountered could be attributed to the operation itself. The author advocates a widespread trial of the method.

Local Anesthesia for Prostatectomy. (*L'Anesthésie Locale de la Prostatectomie.*) F. LEGUEN, Paris. *Journal d'Urologie Médicale et Chirurgicale*, June 15, 1914.

The author does not approve of the two-stage operation of prostatectomy, the first stage under local, the second under general anesthesia. He has had uniformly successful results in the last sixty prostatectomies by using the following technic: Novocaine-adrenalin is employed. After the abdominal wall has been anesthetized and incised in the usual manner the bladder wall is thoroughly infiltrated. The bladder itself has been previously filled with a dilution of the anesthetizing fluid. The bladder is opened and two fingers are carefully introduced to the prostate. With these as guides the line of cleavage about the prostate is thoroughly saturated by the anesthetic. The latter is introduced through long, specially prepared needles; the fluid should run readily into the periprostatic zone, otherwise the needle has been introduced into the prostatic tumor. The urethra is infiltrated where it is to be torn through.

Prostatectomy can then be painlessly performed and complications from the anesthetic have not, as yet, been encountered.

The Effects of Heliotherapy Upon Tuberculous Fistulae. (*Die Einwirkung der Sonnenstrahlen auf Tuberkulöse Fisteln.*) E. KIRSH, Berlin, and H. GRAETZ, Leysin, Switzerland. *Archiv fuer Klinische Chirurgie*, Vol. 104, Part 11.

Rollier's assistant has joined the assistant of Bier in Berlin in a careful study of a small group of tuberculous fistulae treated by the sun's rays. The results were as remarkably good as those reported by Rollier. Fistulae from tuberculosis of the soft parts heal very rapidly (four to six months), and the underlying foci of disease also heal in that time. Tuberculosis of bones and joints presenting fistulae take about one year to heal. All the cases showed complete healing except when the x-ray demonstrated an active tuberculous focus.

The process of healing and its early stages are described by the authors. The object of reviewing the article in these columns, however, is to call general attention to the epoch-making work of Rollier in the field of surgical tuberculosis.

Chronic Intestinal Stasis—"Autointoxication" and Subinfection. J. G. ADAMI, Montreal. *The Proctologist*, June, 1914.

It is clearly shown by Adami that so little is known of the nature of intestinal absorption of toxic material that the term "autointoxication" should be dropped by "any self-respecting member of our profession." He suggests the term "subinfection," for it has been demonstrated that the mesenteric lymph-nodes take up the bacteria, pathogenic and otherwise; that the bacteria are destroyed in the lymph-nodes or in the viscera drained by the lymph-nodes, and that suppurative foci do not develop, but that symptoms appear from the liberation of the toxins of the bacteria. Adami does not deny that the indol group plays a part in the picture of intestinal stasis. He makes most vigorous argument, however, against acceptance of the theories advanced by Lane in favor of side-tracking or removing the colon for one or all of many manifestations that may have no bearing upon intestinal stasis. By discovering the cause of the symptoms a more appropriate method of treatment will be instituted.

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THE COLLICULUS SEMINALIS CONSIDERED AS A FACTOR IN CHRONIC DISEASE OF THE MALE URETHRA

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NEW YORK

Since the invention and perfection of the posterior urethroscope, our methods of diagnosis and treatment have grown apace with the added information that we are now enabled to obtain through the use of this instrument. Whatever style of instrument is employed we are enabled to see for ourselves, to a greater or less degree, the actual pathologic conditions, and in a somewhat limited manner, local treatment may be applied under the control of the eye.

These changes in diagnostic and therapeutic methods necessitate a radical modification of the hitherto prevalent views concerning the causation and medication of the chronic diseases of the posterior urethra. As a result, it may safely be stated that the urologist who does not employ this valuable medium in the management of chronic urethral conditions is, to say the least, not fair to his patient.

Especially is this true as far as the colliculus is concerned. The urethroscope has certainly demonstrated beyond the shadow of doubt that many obstinate and even incurable lesions involving the deep urethra are due solely to an inflammation of the colliculus seminalis or verumontanum. Many of these cases have hitherto been considered in the light of a chronic inflammation of the prostate or seminal vesicles; careful examination, however, reveals the interesting fact that inflammatory disease of the colliculus, from its type and location, is a very great measure the chronic inflammatory lesions of the prostate and vesicles.

The symptoms of this condition are too numerous to be mentioned in a brief communication. They vary in different individuals, there is no characteristic symptom that might be considered as pathognomonic of colliculitis, notwithstanding the fact that a few several symptoms are found singly in one patient; the diagnosis is not at all difficult. Provided the most frequent symptoms based on an enlarged colliculus *per se* are present, are ejaculatory distress and partial or complete impotence. In many instances, these symptoms are transient and when

the colliculus is examined with the urethroscope, we find it more or less congested, swollen, bleeding easily and at times very tender to the touch of the instrument or the applicator.

Another class of patients presents the typical symptom of frequent diurnal micturition; these men are usually highly neurasthenic, constipated, anemic, underfed and poorly nourished. Gonorrhea may or may not have preceded the urinary frequency. Here again, we find a marked inflammation of the colliculus and its adjacent parts. Cysts and polypi are not infrequently observed in these cases, not only on the colliculus itself, but also on the roof of the urethra immediately anterior to the internal sphincter.

Defecation spermatorrhea is usually ascribed to prostatitis, in a case that came under my observation, however, I found the colliculus large, turgid and congested. The prostate appeared to be quite normal, and so were the vesicles. Topical applications to the colliculus brought about a rapid disappearance of the spermatorrhea and thus confirmed the diagnosis. In this particular case the cure has lasted two years.

Stands in the urine and a cold discharge from the urethra is an apparent inability to empty the urethra of the last drops of urine are frequent complaints made by patients who are found to suffer from colliculitis. The last symptom is an especially common one in the neurasthenic and in these patients previously mentioned, but it responds readily to treatment.

It is a strange consideration that because a portion of the urethra lies within the body of the colliculus, which the patients presented the single symptom of sterility due to a spermatorrhea, that the colliculus is not recognized as a factor in the causation of this condition. These patients were strong enough to be able to produce a good stream of urine after defecation. The colliculus is a very important structure, it is the only structure in the male genital tract which is the central point of connection of the seminal vesicles, prostate and urethra. It is the only point of connection of the urethra and the seminal vesicles, and of the urethra and the prostate. It is the only point of connection of the prostate and the seminal vesicles. It is the only point of connection of the prostate and the seminal vesicles. It is the only point of connection of the prostate and the seminal vesicles.

See Fig. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.

floor of the prostatic fossa toward the vesical neck. At first sight, these bands gave the impression of a trabeculated bladder, with the difference that there was no crossing of the bands, all of them radiating outward like an opened fan. The ejaculatory ducts could not be discerned.

CASE II. (See Fig. 20). A very highly inflamed colliculus, the base deep red, streaked with white and gray, and bleeding easily when touched with a probe or cotton carrier. From its anterior surface, a cauliflower-like polyp arose, behind which could be seen the outlines of a large cystic mass. Ejaculatory ducts could not be found.

CASE III. (See Fig. 21). A large deformed colliculus, utterly obscured by innumerable large and small cysts; total cystic degeneration; when punctured, some of these bodies gave forth a creamy white cheesy substance, which dissolved readily in the irrigating fluid. The ejaculatory ducts not visible.

It must appear that in these instances, the conditions which caused these great changes in the colliculus, must also have obliterated the ejaculatory ducts.

When we study the etiology of this condition we find that gonorrhea is a frequent but not an essential factor in its causation. As a matter of fact, I see perhaps as many cases of colliculitis without a previous gonorrheal history as with such a history. In nearly all cases, however, whether of gonorrheal origin or otherwise, some form of sexual excess or abuse may be observed. Masturbation, excessive coitus, excitement without gratification are commonly present; in fact, the diagnosis of masturbation may often be made by the enormous hypertrophy which the colliculus undergoes as a result of this practice. I believe that Luys first called attention to this feature some time ago. It is also interesting to inquire in this connection, whether we are dealing with a vicious circle—that is, whether the colliculitis is the cause or the result, or perhaps both, of these sexual disturbances. In most cases it is difficult to answer this question. The same is true of those instances in which a lukewarm individual suddenly or gradually assumes a sexual passion almost beyond restraint or control. A congested colliculus is invariably associated with this condition—whether as cause or effect, I cannot say.

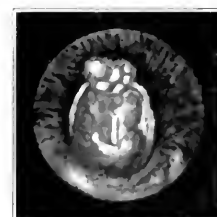
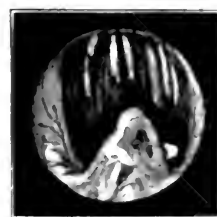
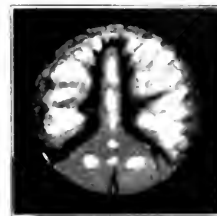
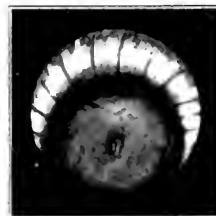
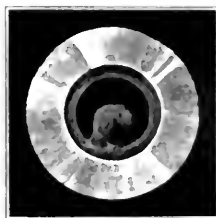
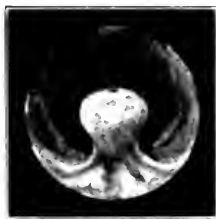
My experience leads me to believe that the colliculus is an important factor in transforming a mild and tractable gonococcus infection into a stubborn and well-nigh incurable process. This is especially true when the colliculus has been the seat of chronic inflammation, and now has superimposed on it an acute gonococcus infection. When we look back on our anterior urethritis cases that have gone along well for two or three weeks, and then suddenly

develop a posterior involvement without any apparent inflammation of the prostate or seminal vesicles, and that are characterized by an unusual obstinacy and resistance to treatment, it seems quite likely, in the light of our new knowledge, that we have had to deal with an acute inflammation of a chronic colliculitis, pure and simple. Such a diseased colliculus surely offers a favorable nidus for the growth and development of the gonococcus; it is therefore quite certain that this little organ plays an important rôle in favoring the extension of the inflammatory process to the prostate and seminal vesicles. I have often thought of this little structure, in this connection, as a glandular oasis in the comparatively desert-like posterior urethra, which, as is well known, offers but a poor soil for the growth and development of the invading gonococci.

The pathologic changes which the colliculus undergoes in the course of these diverse inflammatory processes are quite numerous and varied. Thus we find erosions, granulations, polypi, cysts, papillomata, excrescences, vegetations, hypertrophy, simple congestion, swelling and deformities of various types.

In many instances, however, especially in the gonorrheal variety, the glandular orifices running along the sides of the colliculus are also involved in the general process. I have succeeded, at times, in expressing pus through these orifices by massaging the prostate, by rectum, with the instrument *in situ*, and the pus could be seen exuding through these little slits in much the same manner as the thicker stream of pus enters the bladder from the ureteral orifice in a case of surgical kidney. To be sure, the prostate must be large, soft and boggy to lend itself kindly to this procedure. On the other hand, if these orifices are narrowed or entirely occluded by the inflammation, they act as a bar to the proper drainage of their glandular ducts; it therefore becomes essential to enlarge these orifices, either by dilatation or cutting, and in this way provide suitable drainage for these infected glands. This method, properly applied, will often bring about relief and even a total cure in otherwise incurable cases.

The close anatomic and physiologic connection between the colliculus and the seminal vesicles need not be dwelt on. French writers speak of the utricle as the "mirror of the seminal vesicles," because of the possibility of determining the pathologic state of the vesicles by the picture presented by the utricle. In this respect the analogy between the utricle and the ureteral orifice is very striking. Just as the ureteral orifice mirrors the conditions existing in the kidney and ureter, so we can study the seminal vesi-



cles by observing what changes have taken place in the utricle, because this little body is invariably involved in sympathy with an inflammation of the vesicles. As a rule, in the normal case, the colliculus is not highly sensitive to touch; when, however, it becomes acutely inflamed, as in acute posterior urethritis, it is not only sensitive, but actually painful, at times, and this is made evident by the frequency of nocturnal emissions, which are often accompanied by severe pain. In the chronic state, the tenderness often persists, and posterior urethroscopy is thus rendered impossible without the employment of a local anesthetic. The slightest touch of the examining instrument causes a great deal of pain, at times, which persists as long as the instrument lies in contact with the organ.



Fig. 21.

We may go a step farther in this direction. As a result of our better technic and superior instruments, we can now catheterize the ejaculatory ducts, in the hope thereby of bringing our therapeutic attack to bear on the diseased vesicles. Particularly in this therapy indicated in cases of vesicular retention, that is, when stripping and massage of the seminal vesicle fails to empty the sac, because of occlusion of the corresponding ejaculatory duct.

It has been suggested that it may even be practicable to apply medication to the ejaculatory ducts and the seminal vesicles by means of a fine catheter inserted into the orifices of these ducts. I have not had sufficient experience along this line to say what merit the suggestion possesses, but I feel quite certain that in the course of time this will become as practicable a procedure as catheterization of the ureters and lavage of the kidney pelvis.

Catheterization of these ducts will also be of value in cases presenting painful and bloody ejaculations, and in almost all types of chronic spermatoecystitis. It goes without saying that intervention of this kind should never be employed in acute conditions of the lower urinary tract; it should be reserved for chronic conditions, particularly after the colliculus and the adjacent parts have been well studied and the diagnosis fully made.

Concerning the treatment of colliculitis and the technic pertaining thereto, suffice it to say, for the present, that the field is a new one and that the methods are still in their embryonic state. Enough has already been accomplished, however, to warrant the statement that with the aid of a suitable posterior urethroscope and sufficient experience on the part of the operator, striking results are obtained in the alleviation of chronic conditions that have heretofore been considered almost hopeless.

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LEGENDS FOR ILLUSTRATIONS.

- Fig. 1. Dome-shaped colliculus (normal).
- Fig. 2. Door-knob shaped colliculus (normal).
- Fig. 3. Same as Fig. 2. Seen with the simple straight tube, unmagnified.
- Fig. 4. Normal colliculus, summit flattened.
- Fig. 5. Cone-shaped colliculus (normal).
- Fig. 6. Fungus-shaped colliculus (normal) (Wossidlo).
- Fig. 7. Hypertrophied colliculus: suggestive of chronic masturbation (Luys).
- Fig. 8. Phallus-shaped polyp arising from the apex of the colliculus.
- Fig. 9. Colliculus covered with small cysts.
- Fig. 10. Large colliculus covered with papillomata (Wossidlo).
- Fig. 11. Pointed colliculus with multiple cysts on the roof of the urethra directly above.
- Fig. 12. Colliculus with long sausage-shaped cyst anteriorly and small cyst posteriorly.
- Fig. 13. Same as Fig. 12, after both cysts were punctured and removed: slight traces visible.
- Fig. 14. Fine stream of pus exuding from left ejaculatory duct, upon massage of prostate, with instrument in situ; the pus is being washed backward into the bladder by the flow of the irrigation fluid.
- Fig. 15. Solitary cyst of colliculus: the only abnormal lesion visible in a case of total impotence in a man, aged 25 years; negative venereal history.
- Fig. 16. Polyp on summit of colliculus (Luys).
- Fig. 17. Ulcerated and deformed colliculus (Wossidlo).
- Fig. 18. Same as Fig. 17, after treatment.
- Fig. 19. Congested colliculus with fibrous bands emerging from its substance and extending backward toward the vesical neck; orifice of ejaculatory ducts not visible; azoospermia.
- Fig. 20. Highly inflamed colliculus, with red, bleeding base, from which emerge a cauliflower polyp anteriorly and a large cyst posteriorly; ejaculatory ducts not visible; azoospermia.
- Fig. 21. Large deformed colliculus, with universal cystic degeneration; when punctured these cysts contained a cheesy material which easily dissolved in the irrigation fluid; ejaculatory ducts not visible; azoospermia.

THE TRAINING FOR SURGERY.

To become a useful surgeon the candidate, after graduation, should spend at least eighteen months as an interne in a hospital having a well-trained and organized attending staff. The hospital training should cover general medicine and surgery, including their subdivisions, and a course in anesthetics must not be neglected. The hospital training forms the nucleus for the further development in either medicine or surgery, or the specialties. After completing the internship one should serve as assistant to a surgeon of known ability, devoting a reasonable amount of time assisting at operations. Assisting more than three hours daily in actual operative work deprives the assistant of too much energy, for he must devote study to the patient, case histories, reviewing the surgical literature, and devoting not less than two hours each day to laboratory anatomy and pathology. Six hours weekly should be given to experimental surgery upon animals.—H. W. WIGHTMAN in the *Medical Record*.

dition to the proteolytic effect of their enzymes. Even the somatic cells take on an amoeboid movement and become phagocytic, assisting in the process.

By the third day the proliferation of cells is at its height and capillaries are budding. The fibroblasts produce their striae, these interlock, gradually the cell diminishes, the striations become more abundant and cicatricial tissue is formed. Suppurative inflammation in a wound is the result of a profound attraction of leucocytes to the area of injury without disintegration. Healing is not due to any inherent propensity. It is always brought about by the action of auxetics. These auxetics develop through tissue death. So it is that "through death we live." The physiological auxetics of the body stimulate normal body growth; the pathological auxetics, the result of irritation, particularly when there is excessive alkali, induce irregular cell proliferation.

Healing is a chemical process, and, not unlike all Nature's emergencies, the work is at first physiological, then pathological. The profound attraction of white-cells ends in an excess and pus is produced. Vascularization extends beyond normal limits with pain and tenderness. The all-important serum becomes impotent, favoring infection.

Healing, it will be seen, has three stages: at the time of injury there is a hemorrhage, which is a flushing process tending to dislodge and remove foreign matter and entering germs; then, come the leucocytes which dissolve and devour dead tissue and that which is being sloughed off; the third stage is one of hyperemia, bringing in the serum and filling up the interstices.

The logical treatment of wounds is to assist Nature, and not in any way interfere with her workings. For all art is idle that is not based on a scientific and precise knowledge of that which is inevitable.

In the treatment of the first stage, the only call to which the physician is able to respond is the elimination and control of the entering microbes. Nothing should be done which tends to force them deeper into the tissues. No technic is correct which through cleansing of the neighborhood allows of the introduction of more germs. Irrigations with antiseptics and bactericides are risky because of the tendency to open up spaces and diffuse rather than cleanse out. Most antiseptics are as injurious to body tissue as to micro-organisms, but we have two substances which disturb cell life very slightly and yet have a strong potent influence on the germs, namely, tincture of iodine and solution of potassium-mercuric iodide. With the latter we have had little

experience, but experimentation seems to indicate that it is a preparation reliable as a germicide and not dangerous to tissue cells. In tincture of iodine we have that which is almost a type. It is a halogen, that is, a substance rather closely allied to the colloids. It does not damage the wounded surface materially; it is actively bactericidal and through its local stimulating effect tends to bring into the wound the serum and its contents.

On February 7, 1910, Miss Y., a patient of Dr. Dinglestedt's, fell and suffered a compound fracture of the leg. The tibia was pushed through and a fragment broken off. She was removed to St. Mary's Hospital, Hoboken, where she was seen by me. There was a wound about 4 cm. in diameter with the tibia protruding. Under anesthesia reduction was made and after careful cleansing of the skin, with the stoma protected, the cavity was injected with over an ounce of tincture of iodine. Gauze was placed on the wound and kept sopped with 50% alcohol for three days. At the end of this time the gauze was removed and the cavity again injected. At the end of nine days the cavity had filled and the external wound was closed. She had no discharge of pus from the cavity during this time and the compound was quickly changed to a simple fracture.

Encouraged by this unusual result since that time all compound fractures have been treated in a similar way with an equally good result. If the case is not seen in time to give the patient this type of treatment promptly, the wound may then go on to the second stage, that of superficial necrosis—necrosis of the fascia—associated at times with more or less extensive gangrene, the phagocytes actively working to separate detritus through lysis and phagocytosis. The system is being protected by the sloughing-off process. Germs are growing actively, and through their toxins tend to inhibit the anti-bodies and kill off the phagocytes.

We have in simple yeast another organism of the same type as the bacterial micro-organisms, but of a somewhat higher grade in life, consequently with a more vigorous hold on life, stronger enzymes, and deadly to the microbe. The relation of yeast to the microbe is the same as the microbe to the white cell. The ferments of the yeast are proteolytic. As the end products in yeast life are the nascent lactic and succinic acids and alcohol, we have very potent anti-putrefactives. These are also actively bactericidal. The yeast plant is a passive phagocyte. It does not actively grasp the germ, but yeast cells are discovered full of germs and the enzymes in the plant inhibit them.

Yeast is also chemotactic. It induces leucocytosis and stimulates the functions of the white-cells. It has the same chemotactic power over the microbes that they have over the leucocytes. It is especially

years. Severe mental depression occurred in ten to thirty-three per cent. of cases. Of 157 patients subjected to double oophorectomy, two became violently insane. Sex instinct was entirely abolished in over sixteen per cent. Reviewing the results of one thousand oeliotomies, of which fifty were unilateral salpingo-oophorectomy for pelvic inflammatory lesions, Giles concludes that even the extirpation of one ovary may cause distressing irregularities, e. g., there was diminution or cessation of menstruation in sixteen per cent. of the cases, and in twelve per cent. the sexual desire was lessened or entirely abolished. The observations of Norris show that of 133 cases in which one ovary was removed, menstruation was diminished or irregular in fifty.

Statistics of other operators show even more disastrous after-effects of double oophorectomy. For instance, the observations of Sherwood-Dunn in one hundred cases where both ovaries were extirpated indicate the following results: 78 per cent. subsequently suffered notable loss of memory; 60 per cent. became more irritable with "violent and irresponsible fits of temper;" 42 per cent. suffered from mental depression, 10 per cent. being so depressed as to verge upon melancholia; in 75 per cent. there was a diminution in sexual desire, and some of these claimed they experienced no sexual pleasure; 13 per cent. were not relieved of pain and other symptoms; 35 per cent. increased in weight, and some became abnormally fat; some complained of a diminution in the acuity of vision; 12 per cent. had change in voice to a more masculine quality; 15 per cent. suffered from irregular attacks of minor skin disorders; 25 per cent. had severe headaches; equally as many complained of nightmare; 5 per cent. suffered from insomnia; in a few cases there existed a sexual hyper-excitability not present prior to the operation.

According to Martin the physiological value of the ovaries may be realized by noting that their extirpation is followed by: (a) amenorrhea (95 per cent.); (b) atrophy of the uterus, and, to a less extent, of the vagina and vulva; (c) the nervous symptoms of the menopause; (d) diminution or abolition of sexual instinct (in the majority); (e) obesity. "If one ovary, or only a portion of an ovary be left behind, these results do not ensue."

The obviously erroneous statement has been frequently reiterated in surgical literature that, where hysterectomy is performed, the ovaries and Fallopian tubes being thereafter considered practically useless, their extirpation should be also recommended, even although they exhibit no macroscopical evi-

dence of gross pathology! The pertinent fact has evidently been overlooked that the ovaries and uterus, having no distinct functional relationship, neither should be sacrificed unless required by pathology which cannot be otherwise eliminated from the economy. Many years ago Claret (1896) and Glaveck (1889) cited conclusive data to substantiate their assertion that the ovaries do not rapidly atrophy and thus become functionless following hysterectomy as was formerly quite generally believed, the most reasonable presumption being that modification of reflex disturbances, where the ovaries were permitted to remain in situ after hysterectomy, was due to their continued functional activity and the consequent effect of the normal ovarian secretion upon the general metabolism.

While as already intimated the meagre clinical data of value contributed to the literature of ovarian conservation is surprising, considerable research and investigation have been prosecuted during recent years, the results of which emphasize the importance of promoting and maintaining the normal ovarian secretion; and the following clinical facts have been fairly well established, according to Marshall, Chipman, Polak, et al. That the parenchyma cells of the ovary secrete a substance which reacts upon the general body metabolism, and controls especially the nutrition, growth and activity of the uterus. "This secretion is present at all times in greater or less quantity, but it is produced in greater abundance at recurrent periods, when it brings about those conditions of growth and hyperemia which characterize the proestrous or menstrual process. After ovulation, which occurs during the estrous, the secretory cells of the ovary show still greater activity, and cells of the ruptured Graafian follicle become converted, largely by a process of simple hypertrophy, into luteal cells of the corpus luteum." Chipman believes that the added secretion of these luteal cells raises the nutrition of the uterus, which leads to those decidal changes in the uterine mucosa which insure the engrafting of a fertilized ovum. When such engrafting occurs, this secretion maintains the nutrition and growth of the placenta until the latter reaches maturity. The decadent and fibrotic changes which the placenta undergoes during the latter months of gestation are coincident with the retrogression and disappearance of the luteal cells. Thus the ovary, while maintaining a perpetual secretion, undergoes a series of cyclical changes which increase or modify this ordinary secretion, and with these the changes in the uterus are correlated. While the exact nature of this secretion is unknown, it is

pelvis. Not infrequently an ovary not otherwise involved is found embedded in adhesions; if they are non-inflammatory and not extensive, the case may be considered favorable for the practice of conservatism. There are also cases where the adhesions are dense and extensive, yet the ovary may be liberated without injury and preserved. However, where the ovary is buried in dense inflammatory tissue, it is impossible in some instances to free it without extensive injury, thus rendering conservatism impossible.

Esch regards the pus contained in ovarian abscesses as peculiarly virulent, and states that in those of puerperal origin the organisms travel through the broad ligament to the ovary. On the other hand, in many instances where the diplococcus of Neisser is responsible, the infection owes its origin to "surface contamination" and is not the result of organisms within the ovary.

The value of conservative or radical technic will always depend upon the accuracy of the pathological diagnosis, which should apply as well to diagnosis before, as during the operation." Nearly every surgeon has doubtless practiced conservatism with both favorable and unfavorable results. While in some cases which were considered most favorable failure has occurred, this should not be permitted to unduly influence any one against the practice, since success can only be attained by (a) studying the pathology when the abdomen is opened, (b) having a thorough knowledge of the requisite operative technic, (c) understanding the limitations and contraindications to successful conservatism, and (d) in being able to follow the future of the patient. If these principles are adopted many years of comfortable life may be given to the individual. Some of the rules, the observance of which are necessary to insure success, are:

- (1) The exercise of mature surgical judgment.
- (2) The maintenance of an adequate blood supply to the ovary.
- (3) The suspending of the ovary as nearly in its normal position as may be possible.

The surgeon's first concern in the exercise of mature judgment is in the treatment of existing adhesions. He must carefully dissect the adhesions from surrounding structures, leaving the surface of the ovary as clear of inflammatory tissue as possible. If the ovarian tissue be seriously injured either resection or entire removal should be practiced. If inflammatory tissue be left upon the ovary, it will favor the re-formation of adhesions and thus defeat the object of the operation.

Small cysts, few in number, may be punctured and their contents allowed to escape. Resection is

indicated where a single retention cyst is present, but in cystic degeneration where the entire ovary is involved, extirpation and not resection should be performed. In hematoma resection should also be adopted.

In performing resection a knife is preferable to scissors, as the latter (unless very sharp) will unduly squeeze or pinch the ovary. All pathological tissue should be excised, the denuded surfaces being united by a continuous suture of fine catgut, which controls hemorrhage more satisfactorily than a few interrupted sutures. Continued oozing may cause an hematocele, followed by infection and the formation of adhesions unless this plan of closure be adopted.

Properly suspending the ovary, whether resected or not, is a simple but important feature in the operation, the ovary being thus elevated and kept out "of its bed of adhesions." For this purpose a small needle threaded with silk or catgut is passed through the external end of the ovary, then through the upper and posterior surface of the broad ligament.

The question of maintaining a normal blood supply to ovarian tissue left in situ is one of the utmost importance. Failure in accomplishing this has been the cause of many unfavorable results following conservative surgery of the ovaries, edema and cystic degeneration later developing. By studying the ovarian blood supply one may readily appreciate that it may be easily interfered with unless care be exercised in the placing of ligatures where the ovary is not extirpated. In the performance of salpingectomy, when the tube is severed from the meso-salpinx, care must be exercised to incise the meso-salpinx through its extreme upper border. This will leave the blood supply to the ovary normal, and the meso-salpinx will be satisfactory for ovarian suspension. The utero-ovarian anastomosis is especially in danger of being ligated at the external uterine cornu, where the large blood vessels are situated near the tube. In ligating the uterine end of the tube the operator should be careful that the ligature does not extend deeply into the broad ligament, but only includes the upper and inner edge of the meso-salpinx. Blood vessels should be ligated in the upper border of the meso-salpinx as near the cut edge as possible, and in "whipping over" the meso-salpinx one must be careful not to draw the sutures too tightly, otherwise puckering of the tissues (including the blood vessels) will occur and circulation will be markedly interfered with. Excessive manipulation and traumatism of the ovary during the operation should be avoided, and absolute asepsis and hemostasis must be maintained to insure successful results.

Kittlitz, 1897, reported 23 high operations with 11 deaths; and Hillsmace, 1899, records 40 such operations with 20 deaths, thus showing a mortality of 50 per cent. before 1900. Streickeisen, 1903, reports 26 operations with only 5 deaths.

Any discussion of Cesarean section *per se* would be incomplete without reference to the voluminous statistics of Dr. R. P. Harris (1885-90), Philadelphia. But as the following cases refer only to the suprapubic route for eclampsia alone, his work will not receive further consideration. The same may be said concerning the work of Dr. Ruben Peterson, who gives the following four tables to show the maternal mortality in prompt delivery, and the expectant treatment of eclampsia.

—Prompt Delivery—		—Expectant Treatment—	
No. of Cases.	Mortality %	No. of Cases.	Mortality %
615	98=15.9	390	113=28.7

Showing Results of Immediate Delivery and Conservative Treatment of Eclampsia

—Immediate Delivery—		—Conservative Treatment—	
No. of Cases.	Mortality %	No. of Cases.	Mortality %
150	6=4.0	147	46=31.2

Maternal Mortality After Spontaneous and Operative Delivery in Eclampsia Before 1900.

—Spontaneous—			—Operative—		
No. of Cases.	No. of Deaths.	Mortality %	No. of Cases.	No. of Deaths.	Mortality %
1,126	263	23.35	1,443	406	28.13

Maternal Mortality After Spontaneous and Operative Delivery in Eclampsia Between 1900 and 1912.

—Spontaneous—			—Operative—		
No. of Cases.	No. of Deaths.	Mortality %	No. of Cases.	No. of Deaths.	Mortality %
290	57	18.96	1,490	222	14.83

The fetal mortality by operative measures from 1900-12 has been reduced from 41.17 to 28.6 per cent.

In 315 by vaginal section the mortality was only 21.2 per cent. when vaginal section was made; when only three convulsions occurred the mortality was only 11.8 per cent.

Ruben Peterson (*Surg., Gynecol., and Obst.*, p. 203, August, 1913) states that in 425 cases of eclampsia treated by abdominal Cesarean section, the maternal mortality before the aseptic era was 36.9 per cent. and that in 317 of this number, since 1900, the mortality has been reduced to 31.8 per cent. In 245 cases without infection the mortality was but 24 per cent. In 317 cases, since 1900, the fetal mortality has been 5.5 per cent., and the mother but 3.7 per cent. in 132 cases where the sections were performed after one to five eclamptic convulsions.

That the severity of successful and unsuccessful cases operated on has been greater than those treated medicinally there can be no question.

Peterson's final conclusion is, that the "operative procedure which will empty the uterus the quickest with minimum trauma and shock to the eclamptic mother and child should be selected."

Fetal mortality has generally been 44 to 54 per cent., but this high percentage has been reduced to

about 25 per cent. Many children are saved though the mother be dying or dead, but few mothers are saved if the child be dead. This would of itself indicate that the majority of each may be saved with early operation—after the first convulsion or the beginning of the comatose state.

Eclampsia ceases more frequently after artificial than natural labor.

Dr. T. Halbertsma (*Nebrl. Weekbl. and Obst. Gaz.*, xiii, 1890, Cinti.) has performed Cesarean section in three cases of eclampsia. In the first case, operated on 1878, the child was saved, but the mother died of peritonitis. In the second case, in 1888, both mother and child lived, the mother being discharged in six weeks after the operation as perfectly well. In the third case the operation was performed after hypodermatic injections of morphine and inhalations of chloroform had been tried without effect; mother and child were saved. The author recommends this mode of treatment on account of the very unfavorable prognosis of eclampsia.

Goltomo (*Gazz. med. di Torino*, xlii., pp. 205-225, 1892) and Brothers (*Amer. Jour. Obst.*, New York, xxiv, 1896) each report upon this method of suprapubic section for eclampsia. Kittlitz, 1897, reported 23 cases of abdominal Cesarean section maternal mortality of 50 per cent. Hillman, 1899, records a case stating that the maternal mortality varies in 40 cases from 40 to 52.5 per cent.

Olshausen, 1900, performed abdominal Cesarean section three times out of his last 250 cases of eclampsia, saving two mothers and three children. Streickeisen, 1903, adds 26 cases to those of Hillman with a maternal mortality of 26 to 32 per cent. Sir J. H. Croom (*Trans. Edinburgh Obst. Soc.*, vol. xxxix, p. 194, 1903-04) records two cases, the first operated on in Scotland; one a primipara, 20 years of age, near full term (a Porro), os undilated. Death followed six hours after operation; contracted pelvis. Second case, primipara, aged 46, contracted pelvis, elongated cervix, died at end of two days; child lived. Dr. F. J. McCann, 1908 (*London Lancet*, September 10, 1910), reports a case of 26 years; primipara; os rigid and elongated; child born dead; mother lived; fits ceased after operation.

Dr. J. B. Murphy states that he has never seen a fatal case of Cesarean section, while Dr. E. C. Dudley says: "I regret to say that I have no experience in the subject of abdominal Cesarean section for eclampsia."

Judd (*Surg., Gyn. & Obst.*, p. 552, June 19, 1913) states that various observers believe Cesarean op-

eration to be the safest in cases of placenta previa, and in some cases of eclampsia, and that uncontrolled hemorrhage is an indication for removing the uterus, although Cesarean section has not been done for eclampsia in Mayo Clinic.

Horton Lyng in Hospital, July 3, 1913, replies: "We have had two cases of Cesarean section (abdominal) done for eclampsia without mortality. There have been five vaginal Cesarean sections for eclampsia. Of these, one mother died, three babies died, and one was still born. (five months miscarriage). Our visiting physician has performed two abdominal Cesarean sections for eclampsia in his private practice with no mortality."

Massachusetts Homeopathic Hospital answers as follows: "During the year 1912 there were ten Cesarean sections performed at this hospital for puerperal eclampsia, of which two died and two recovered. In 1911 there was one, who recovered. This year there has been three and two such cases, both recovered."

E. P. Davis' reply of June 27, 1913, is as follows:

I have not kept separate statistics for puerperal eclampsia and Cesarean section, because I group eclampsia cases with infected and toxemic patients, and from the standpoint of Cesarean section as an operation, eclampsia is not especially interesting. My statistics of Cesarean section up to date are as follows:

Patients in fair condition, that is, not highly toxemic nor having streptococcal infection at the time of operation, 195. Maternal deaths, 1, from infection with *Staphylococcus vulgaris*. The source of the infection could not be ascertained by autopsy. Maternal mortality, therefore, 0.5 per cent. Total mortality in all cases, 1 child in fair condition, and

Cases highly toxemic, including eclampsia, having pneumonia, heart disease, or septic infection, 30. Maternal deaths, 10. Patients recovering were those delivered by the thoracic operation, and were septic at the time of operation. Total mortality in this series cannot be calculated, as all were in a highly diseased condition.

Post-mortem and postnatal culture. (2) Total, 137.

The kind of operation employed were as follows:

1. Total hysterectomy, 81. 2. Total hysterectomy, 34. 3. Partial hysterectomy, 20. 4. Cesarean section, 20. 5. Cesarean section, 2. Total maternal deaths, 10. 6. Cesarean section, 7. 7. Cesarean section, 2. 8. Cesarean section, 1. 9. Cesarean section, 1.

As to the results of the thoracic operation, the results were as follows: 1. Cesarean section, 20. 2. Cesarean section, 2. 3. Cesarean section, 2. 4. Cesarean section, 1. 5. Cesarean section, 1. 6. Cesarean section, 1. 7. Cesarean section, 1. 8. Cesarean section, 1. 9. Cesarean section, 1. 10. Cesarean section, 1.

The results of the thoracic operation were as follows: 1. Cesarean section, 20. 2. Cesarean section, 2. 3. Cesarean section, 2. 4. Cesarean section, 1. 5. Cesarean section, 1. 6. Cesarean section, 1. 7. Cesarean section, 1. 8. Cesarean section, 1. 9. Cesarean section, 1. 10. Cesarean section, 1.

and one child died in the stomach. The bowels did not move, and the patient died. The patient is now well, and she is put in a hot pack. If the bowels are dilated the membranes are ruptured. If labor develops and can safely and speedily be terminated by forceps or version, this is done. If the patient does not improve, and if labor does not develop and the patient is at or near term, she is delivered by celiohysterotomy.

In our experience Cesarean section indicated in eclampsia in not more than 20 per cent of cases. It should, however, be promptly performed if unobviant does not otherwise follow.

Dr. E. B. Montgomery states: "My experience is confined to one case that was no more than threatened eclampsia. Patient was seen on the 23d of February, 1912, and had almost complete suppression for twenty-four hours, then pregnant eight months. Under benzoate of calcium in plenty of water, the amount of urine was considerable increased, but the arterial tension, which measured 175 under nitroglycerin in .01 gram doses was reduced only to 160. She complained of severe headache, pulse slow and tension very high. It was her first pregnancy, the superior strait was contracted and the vagina small. Under such circumstances I decided the chances for the child were best by the Cesarean section. This was done on the 26th of February, and the patient never had an unpleasant symptom following. The child survived, and although it weighed but four pounds, it is now a strong, healthy child, and the woman has enjoyed excellent health ever since."

Dr. S. S. Halderman, Portsmouth, Ohio, reports as follows: "Mrs. K., white, primipara, comatose when first seen in June, 1909, but not convulsive. Celiohysterotomy. Recovery, uneventful. Mother and child living July 7, 1913."

Dr. A. H. Barkley, Lexington, Kentucky, July 20, 1913 reports the following case:

Case 1. Mrs. A., aged 30, wife of 1 child living 16 1/2 years, no hemis, and had two sons. (One before first visit.) At the end of the second convulsion the uterus rigid, and the urine contained cast and albumen. After convulsions after convulsions, the patient recovered. Mother and child recovered.

Case 2. Mrs. B., aged 28, wife of 1 child living 13 years, no hemis, before operation, no convulsions, and no hemis, and had two sons. (One before first visit.) At the end of the second convulsion the uterus rigid, and the urine contained cast and albumen. After convulsions after convulsions, the patient recovered. Mother and child recovered.

Case 3. Mrs. C., aged 28, wife of 1 child living 13 years, no hemis, before operation, no convulsions, and no hemis, and had two sons. (One before first visit.) At the end of the second convulsion the uterus rigid, and the urine contained cast and albumen. After convulsions after convulsions, the patient recovered. Mother and child recovered.

Case 4. Mrs. D., aged 28, wife of 1 child living 13 years, no hemis, before operation, no convulsions, and no hemis, and had two sons. (One before first visit.) At the end of the second convulsion the uterus rigid, and the urine contained cast and albumen. After convulsions after convulsions, the patient recovered. Mother and child recovered.

and child recovered; the latter weighed 10½ pounds.

CASE V:—Mrs. C. Third labor. Four convulsions before operation. Ovarian cysts in lower pelvis. Os 1½ inches in diameter. Bladder empty. Mother and child recovered. Chloroform anesthesia for the five cases.

Dr. Fitch, of Portsmouth, Ohio, July 8, states as follows: "Mrs. H., aged 23, family history good. Eighth month of gestation. Saw patient first on April 22, when she was recovering from convulsion, was cyanotic, cardiac action weak, unconscious. I made an examination, and found soft parts swollen, and a narrow, contracted pelvis. Had council, and decided to remove her to hospital, and perform Cesarean section, without attempting to deliver by the vaginal route, as the patient was not in labor, and there was no dilatation of the os. Child was removed from abdomen in seven minutes, was weak and weighed only three pounds, and died on the third day. Mother made a good recovery, and was discharged from hospital the 18th day, but had albuminuria for five weeks."

Dr. F. W. Williams, Portsmouth, Ohio, July 9, 1913, made a celiostomy in 1905, for puerperal eclampsia, without convulsions. Patient, aged 30, first child, comatose for thirty hours. Great adiposity. Child dead for several hours. Patient lived for twelve hours.

Dr. Stuart McGuire, Richmond, Va., July 15, 1913, states: "Have personally done two suprapubic Cesarean sections for puerperal eclampsia. Both women had gone to full term. Both mothers and one child lived. The os was dilated in one case, but labor had not begun in the other. Both cases were operated on within twenty-four hours after the first convulsion. One woman had never been pregnant before; the other had one child."

Dr. Thos. J. Watkins, Chicago, July 12, 1913, states that he has done one such operation for eclampsia at full term, with undilated os, four hours after first convulsion. First pregnancy; saved both mother and child.

Dr. F. F. Lawrence, Columbus, Ohio, July 19, 1913, states: "I have performed but one Cesarean section for puerperal eclampsia. That at the seventh month. The os was not dilated. The operation was performed 5½ hours after the first convulsion. It was the third pregnancy. Mother recovered. Child was not saved. There was but one slight convulsion after the operation. Because of the fact that there was a fibroid in the left anterior wall of the uterus, I performed a Porro operation. This was almost seven years ago, and the woman remains in excellent health."

Dr. Shelton Horsely, Richmond, Va., July 20, 1913 reports: "Two Cesarean sections for eclampsia. In both a typical abdominal operation was done. The period of gestation was between seven and eight months. In one case there were twins. In both instances the mother had been having convulsions for ten days, and was almost in a moribund condition and unconscious when they were delivered. Both mothers and all the children died. One mother lived two days, and the other fifteen hours. All the children were born alive, but died within three days."

Dr. W. D. Haggard, 1907: "Cesarean section, multipara, 19 years old. Pregnant eight months. No pains. Convulsions for several hours. Child and mother living four months after."

The Johns Hopkins Hospital states that they have treated 112 cases of eclampsia. Cesarean section was done in only two cases, and there were no fatalities.

City Hospital of St. Louis states: "In the year beginning April 1, 1909, and ending March 31, 1910, there were two cases, both received after delivery, and both died after Cesarean section, one child living and the other premature. In 1910-11 there were three cases, one of which lived twenty minutes after entrance; the other two also died, induced labor being performed; one child had been dead some days, the other child lived. In 1911-12 there was one case, not operated on, and lived. In 1912-13 we had two cases, not operated on, both living. Since April 1, 1913, we have had no cases of eclampsia."

Dr. John C. Altman, Nashville, Tenn., says: "I have had two cases of puerperal eclampsia, for which we did a suprapubic Cesarean section. Both patients were primiparae; one white, and one colored. The colored one was sent into the hospital, having had a number of convulsions, and was markedly comatose. Upon examination I found a large fibroid in lower posterior wall of uterus. She recovered, child being dead before she reached hospital. The other case was 18 years old, primipara, 8½ months, 12 convulsions, cervical canal intact, no labor pains. Mother and child both lived. She has had two subsequent labors without complications. Time from first convulsion to operation, 10 hours.

B. M. Ricketts has done five suprapubic Cesarean sections, with but one for eclampsia, and Edwin Ricketts had five to record without any for eclampsia.

CASE I:—Patient white, 33 years old, 150 pounds, married, well developed, primipara, excellent health during pregnancy.

every purpose without dampness or the dangers of burn.

Nitroglycerin, 1/50 to 1/30 grain, given until its therapeutic effects are noticeable, has been recommended, but there is great doubt as to the advisability of resorting to its use.

Croton oil, given in two drop doses on sugar or flour, soon after the operation, is advisable in those cases attended with difficult evacuation of the bowels. These doses may be repeated if necessary every two hours until eight or ten drops are administered.

Calomel should be given in small doses combined with bicarbonate of soda immediately after the operation.

Ezerine would probably be an ideal remedy if injected into the ileum when the abdomen is open; otherwise it is not to be recommended.

Veratrum viride is the time-honored remedy, and when given in 25-drop doses every twenty minutes until the pulse is diminished in beats to fifty, is supposed to be by a few advocates a panacea. None but the best of preparations should be relied upon. It would seem that the therapeutic effects of the drug have been overestimated, otherwise it would be more generally accepted and lauded. Then, too, toxic doses are ever looked for. It has an accumulative effect that results disastrously. The popular belief that failure to produce physiologic results is due to an imperfect quality of the drug, does not answer the argument against its use. Something more is apparently necessary to prove that veratrum viride will prevent or overcome convulsion in the eclamptic state. It may lower tension, but will not increase excretion of poisons. Will lowering pulse tension prevent convulsions?

Salt and soda solution.

1. Mouth.
2. Intravenous.
3. Subcutaneous.
4. Proctoclysis.

By mouth. If possible water should be given through the mouth and stomach by swallowing, or artificially through a tube, in large quantities.

Intravenous is the most direct, assuring more immediate effects, and when in proper hands is the method of choice. Any vein or artery may be appropriated, though those of the arm are given first, and those of the leg second choice.

Subcutaneous method is more commonly practiced, being more generally understood and easily cared for, especially during the convulsive state. Great care should be exercised to avoid disarrangement or breaking of the tube or needle, an accident

not uncommon during a convulsion. The point of insertion of the needle, which should carry a lumen 1/16 inch in diameter, should be near the mammary glands as low as the umbilicus and extending to a line parallel with the nipples and laterally upon either side to the mid-perpendicular line, the amount varying from six to fourteen pounds, depending upon the body-weight, proportionate with the weight of the body.

Proctoclysis can best be resorted to when the patient is quiet or forcibly kept so, and should be continued until ten or fifteen pounds of normal salt solution have been absorbed at the rate of two drops per second, and of the body temperature.

Phlebotomy has been practiced throughout many centuries, supposedly with brilliant results. Indeed, with the obese and plethoric its benefits cannot be questioned, though other measures may be more appropriate. One to three quarts of blood have been extracted without serious result, depending upon the body-weight.

Bromides, soda potassium strontium, etc., are no doubt of more or less benefit in eclampsia, varying in degree, but not at all curative or of benefit in convulsions severe in type. They are probably only adjuncts in their treatment. They may be given by the mouth or rectum in large doses.

Sodium benzoate, like the bromides, has been suggested, but the results have been equally unsatisfactory.

Chloral hydrate has for many years been a popular remedy, but doses large enough to be at all beneficial are more or less dangerous. Its use has deteriorated, giving place to more certain remedies. When administered, it should be given, well diluted, in large or small doses, by mouth or rectum until physiologic effects are obtained.

II. M. C. is probably seldom indicated, but when convulsions continue, or there is a high degree of restlessness after operation, one or two doses given within two hours will prove beneficial, but like opium preparation is dangerous.

Pulmonary anesthesia by ether, chloroform, gas, or any of their combinations is dangerous to both mother and child, and should be condemned when other remedies can be obtained.

Spinal anesthesia is only mentioned to condemn it upon general principles, such as relate to cord injuries and a high mortality.

Pituitrin: Gorsew (*Surg., Gyn. & Obst.*, p. 564, June, 1913) gives his experience in 48 labor cases, of which 25 are reported somewhat in detail, the author makes the following observations:

Pains begin in from two to ten minutes, accompanied by abundant micturition. Pituitary extract

and the power of the blood to destroy the bacteria that were not washed away.

The sterilization of the skin by iodine was the first method used where surgeons depended entirely upon chemical sterilization. Thus there could be no doubt from a clinical standpoint what agent destroyed or got rid of the germs; and this clinical experience is backed up by the most painstaking laboratory experiments.

Iodine also has other properties that are valuable in surgery. The late Nicholas Senn, years ago, showed that iodine was not only a powerful antiseptic but a potent agent to stimulate local phagocytosis. For that purpose it has one advantage when dissolved in glycerine, over balsam Peru or iodoform, in that it keeps the wound so much cleaner. Iodine also is a potent agent to stop hemorrhage, as pointed out by Emmett in 1880. It acts not by coagulating the albuminoids as does hot solution of bichloride and some other agents, but by contracting the coats of the arterioles. The profession in nearly all countries of the world have seemed to realize the advantage that sterilization by iodine has over other methods, and I have found surgeons using iodine in many out of the way places. In the spring of 1911, I saw them using the iodine method of sterilizing the skin in Barbadoes and other West Indies as well as in Panama; and in my recent trip around the world the iodine method was used in nearly all the hospitals that I visited, not only in Europe but in the Orient.

In 1910 I read a paper before the Association of Rutland Railway Surgeons, in which I summarized the report of a large number of accident cases treated with iodine, in my service as Division Surgeon of the Rutland Railroad; and the only case in which I got any pus was a punctured wound, done with a blunt instrument. The hole was so large I did not incise it and I got pus, but the case made a rapid recovery.

There have been several different methods of using iodine as an antiseptic, but to technic which I have used the last two years I have called "dry cleaning." It originated in Bastianelli's Clinic in Rome, Italy. It has been used in the Mayo Clinic for the past three years. My attention was first called to it by an article on the subject, by one of the Mayo staff. Dry cleaning, or sterilization with iodine, consists of washing the skin with a solution of iodine in gasoline 1-1000; always taking care to wash from the wound. As soon as the skin is dry go over the skin with one-half strength tincture of iodine. If there is much oozing from the muscles after the vessels are tied, apply the tincture of iodine

or pack the wound temporarily with gauze wet 3½% tincture of iodine.

It is very important not to use any water to macerate the epidermis, as the sterilization with iodine will not be efficient.

As tincture of iodine is such a bad agent to have in one's bag, since it corrodes everything, I conceived the idea of having the pure iodine put up in gelatin capsules and sealed. 4.89 grains of iodine in each capsule, mixed with one pint of gasoline, 1-1000 solution, and a capsule of 13.59 grains of iodine in one ounce of alcohol makes 3½% or one-half the strength of the official tincture of iodine.

It has worked out very nicely and I make the solution extemporaneously as required. It is not necessary to combine iodide of potassium with the iodine, and the combination will dissolve the capsules while iodine alone remains dry. Later I tried to get the iodine put up in glass ampules, but have not yet succeeded; but I have learned the surgical department of the United States Army has had several hundred thousand of tubes of iodine with potassium iodide put up for the above purpose, although there has not been any put up for commercial use.

In a few cases where the wounds are very dirty I have irrigated them with a solution of iodine, 2 drams of the tincture to a pint of water, but I never do that until after I have sterilized the skin with the tincture of iodine. If drainage is required I use a split rubber tube with gauze wick moistened with solution of iodine in water or glycerin. When the oozing of blood can be arrested and the wound sewed up, a gelatin preparation devised by my friend, Dr. Townsend, is a very convenient dressing. The gelatin is in thin sheets made antiseptic by incorporating with iodine, and the outer surface has been made water-proof.

My excuse for presenting these rather cursory remarks is the almost uniform results of preventing infection by the assembling of the foregoing simple procedures in contrast to a number of cases where pus developed in accident cases where sterilization had been attempted by very able men by a tedious and complicated technic.

Do not amputate an extremity for sarcoma without a previous careful examination of the lungs and mediastinum for metastasis. Such symptoms as continued cough, a small hemoptysis, or beginning dyspnea, should be regarded as highly suggestive of such a complication.

gated and recommended the knowledge in Jena, as well as in other neighboring towns of Thuringia, by demonstrations and extensive lectures for general practitioners; have directed observations to the appearances, the frequency and the dangers of foreign bodies which have been inhaled; and have not omitted the consideration of the evidence of successful operations in local medical journals. Without doubt, enough has not been done in this direction. How can it, then, be understood that so little is heard of the extraction of foreign bodies in many great cities—above all in Berlin, with its millions of inhabitants? Bronchoscopic literature receives attention almost exclusively in technical journals, whereas it is of extreme importance that the general practitioner should be acquainted with this branch of the study. Bronchial foreign bodies give rise, apart from the rare cases of suffocation, to many symptoms of lung disease. The patient goes to a physician, and, unfortunately, has the experience that the affection is misinterpreted, and that, too, after searching inquiries into the history of the case. This latter is not always a matter of reproach, considering how uncertain and complicated the history can be and, in most cases where children are concerned, often is. Moreover, it must be considered that, in many cases, foreign bodies never give rise to any symptoms, still less to the characteristic ones, and so are not traceable with certainty by any of the usual methods of clinical research. Because, in the most favorable cases, the diagnosis will rest only on the supposition of a foreign body, independent of the greater or lesser probability, the doctors should always justify it by bronchoscopy, even if this only occurs in one case out of ten. If the curve of frequency of foreign bodies is looked at once more, and the extraordinarily great increase considered, the reflection will occur that the previous extractions are associated with a relatively small number of names, which in Germany, for example, are to a certain extent concerned with but a small series of foreign bodies. It also becomes clearly evident that the status of bronchoscopy at the present time gives, as yet, an absolutely incomplete picture of the part which it will play in the hands of the specialist in the future. Surely even Killian never anticipated this development of the subject on the occasion of his first successful extraction thirteen years ago. Requirements often only come to light after the possibility of satisfactory results is established. After these general remarks, it is worth while to look again at the special services of tracheo-bronchoscopy for the recognition and treatment of foreign

bodies. The diagnosis of the foreign body has become possible, in almost every instance, only since the employment of the direct method. Only in 7 per cent. of all published cases could the foreign body not be detected by bronchoscopy, and of these the cause of the failure in many cases was due to insufficient practice or unnecessary instruments, seeing that in the statistics of the last two years, of 291 cases, only two—*i. e.*, 0.7 per cent. of the cases of foreign bodies—could not be seen.

With reference to the service rendered by tracheo-bronchoscopy as a therapeutic measure, I shall now follow the statistics of Kahler, in which he passes in review the persons suffering from foreign bodies in the time before the existence of bronchoscopy. According to Tuffier, up to 1897, out of eleven cases of pneumonia due to foreign bodies, the supposed foreign body was, on ten occasions not discovered; in four cases the operation resulted in death, and Karewsky in 1903, out of fourteen cases of thoracotomy for foreign bodies, could only point to two successes. It is therefore not to be wondered at that many authors advise, in cases of foreign bodies, the adoption of an expectant line of treatment. Thus Weist, after the study of 1,000 cases, advised that, unless dangerous symptoms supervened, foreign bodies impacted in the trachea or bronchial tubes should not be operated on, and that the surgeon should wait for spontaneous expulsion. No further remarks are needed that this aspect of the matter cannot be approved of, in view of the relative rarity of cases of spontaneous healing through coughing up, which amount, according to the statistics of Preobraschenski and Pohl, only to 218 cases out of 1,064—*i. e.*, 20.5 per cent.

The mortality from inhaled foreign bodies was formerly very large. Thus, among untreated cases, more than 770 cases were reported, according to Preobraschenski—*i. e.*, 52 per cent. This number is, however, certainly too small when it is considered how many patients die of lung complications which can be attributed to foreign bodies not diagnosed. The mortality has, at all events, decreased since the discovery of laryngoscopy, because the means of healing laryngeal foreign bodies have been improved. Whilst in prelaryngoscopic times the mortality was 41.2 per cent., it has from 1866 to 1891 been reduced to 30 per cent. The results during the next ten years are still better. Pohl, who carried on the statistical work of Preobraschenski and collected 294 cases from the literature, finds a mortality of 15 per cent. If the treated cases (530) only are considered in the series above mentioned, the mortality amounts to 20.8 per cent.

fast in the larynx or upper air passages, they cause death through suffocation. If, on the other hand, they get down straight away into the smaller divisions of the bronchial system, and remain impacted there, spontaneous recovery may still take place owing to the rapid disintegration which ensues. Substances, however, like fresh fruit, especially when unripe, dried shell fruits, and the pips of fruits with peel, often remain in the moist and warm recesses of the bronchial tree and resist decomposition so long that a serious affection of the lungs may occur. Particularly favorable conditions for spontaneous cure occur in the case of readily soluble substances—sweets, chocolates, etc., and so cases of this kind, in children, hardly ever come up for treatment. On a ski-ing tour I once inhaled a lump of frozen snow, which I was allowing to dissolve in my mouth. The momentary feeling of suffocation was rather strong, but disappeared in the course of a minute or two.

What is the situation in regard to hard-non-friable and insoluble foreign bodies? If they are very small so that they enter the lungs suspended in the form of dust, spontaneous ejection occurs by means of the mucous secretion, ciliary action, and coughing. It is only when large quantities of dust are inhaled that definite lung affections, such as stonemason's phthisis, occur. Larger particles, up to 2 or 3 millimetres in diameter, often have a good chance, because their surface area is relatively great compared with their weight, and therefore presents a relatively larger surface to the action of the ciliated epithelium. The specific weight of the inhaled matter here plays an important part; thus, small fruit pips and the like are scarcely ever retained, whilst, for instance, a piece of tooth filling is only got rid of spontaneously with the greatest difficulty.

The typical bronchial foreign body, as observed in more than 90 per cent of cases, is after all of a firm, relatively heavy type, of a size which enables it to stick in the main bronchus or its larger subdivisions. It is in the majority of cases localized in the right main bronchus, according to Gottstein's statistics, in men in four out of five, in women in two cases out of three. It is not possible to enumerate here in detail the various kinds of foreign bodies and the frequency of their occurrence. Pieces of bone are the most frequent, after that beans and other vegetable matter with the same tendency to swell, then sharp foreign bodies such as nails and needles. Further may be mentioned teeth, false teeth, hollow bodies (fragments of canulas, pencil-covers, penholders and the like), pips and stones of differ-

ent kinds of fruits, grains of corn, small metal objects, shirt buttons, collar studs, cherry stones, prune stones, nutshells, coins, steel pens, glass beads, pebble stones, fish-bones.

How is it that these articles are retained in the lower air passages? In what does the mechanism of retention really consist? Before pursuing the question further, I should like to show here an interesting table of Gottstein's of foreign bodies which have been coughed up spontaneously. The table is arranged in typical groups, and dates from the prebronchoscopic period.

Type of Foreign Body.	Total Number.	Expectorated without Tracheotomy.	Expectorated through Tracheotomy Wound.
		Per Cent.	Per Cent.
Rough, sharp-edged	183	39	6.5
Smooth, round	103	32	32
Bodies liable to swell	101	11	20
Pointed	45	29	11
Smooth, flat	32	37	19
Hollow bodies	25	12	8

Before coming to details, it may be asked why foreign bodies are retained at all, why the natural protective mechanisms of the organism—coughing, ciliary action, secretion—do not suffice in every case to expel the object. The physiology of respiration certainly teaches that expiratory pressure is far greater than inspiratory pressure. In a case of forced expiration it amounts to 85 to 100 millimetres of mercury; in the case of reflex expirations such as coughing and sneezing, it is distinctly higher. A forced inspiration, on the other hand, registers a pressure of about 50 millimetres mercury.

It would naturally be expected that every foreign body would be expelled by the cough which it naturally provokes. How often this really happens is not known; in any case, on closer observation, a succession of mechanical forces may be observed which afford some explanation of the retention which so often occurs. In the first place it must be mentioned that the inspiratory force with which a foreign body is drawn into the bronchial tree is aided by two very material factors. The one is that the direction coincides with that of gravity, and the other the suction-tube action. If a projectile is drawn into the wider end of a conical tube with a diminishing lumen and cannot pass through the narrow end, then it must wedge itself in with the whole energy that it has acquired on the distance traveled, and it is out of the question to displace the projectile with an equal air pressure acting from the narrow end. The less energy that is expended by the foreign body in overcoming angular turnings in the bronchial tree, the more powerful will this suction action become. In every case the foreign body must come to a place in the main path where it becomes more or less firmly impacted, im-

by it must be considered. It has already been shown that the cough loses its characteristic nature of an explosion when the glottis fails to close properly, and therefore the dangerous expiratory collapse of the walls of the bronchi is diminished, although the real expiratory pressure is unaltered. The knowledge of these facts is of the greatest therapeutical importance. Another point that is noteworthy in the above statistics is the rarity with which pointed or hollow bodies are spontaneously coughed up, compared with smooth or round bodies (11 to 12 per cent. against about 33 per cent.). The explanation lies partly in the small surface area they present to the expiratory blast, and partly in their long shape. Needles, nails, steel pens and the like almost always fall with their heavy—i. e., their blunt—end foremost, until this is arrested at some point lower down. The position eventually taken up depends on the width of the bronchial lumen, and is a more oblique one, with the point of the object resting against the wall. Thus the position is a most unfavorable one for an upward movement; and even if this does happily occur, there is always a probability of a repeated arrest at the various angles in the air passages. A large number of general and special causes for the retention of "acute" foreign bodies is therefore seen to exist, and in the next section it will be further seen that the organism possesses very insufficient means for expelling "chronic" foreign bodies, or for rendering them harmless. The prognosis of the foreign body quoad expulsionem generally becomes worse from day to day. In the case of foreign bodies which are firmly impacted and obstruct the lumen, a noticeable swelling of the bronchial mucosa above the point of retention may be observed after a few hours, and this markedly increases the difficulties of artificial extraction. If the foreign body has sharp corners, so that the mucosa is torn by it at every respiratory movement, granulations appear in a few days, or, more rarely, after a week or two. These increase the degree of impaction, and also render bronchoscopic extraction more difficult, owing to their great tendency to bleed. As a further result of the inflammatory reaction, the bronchial wall may be considerably altered, and a scar tissue stenosis may form above the foreign body, and the lumen of the bronchus become almost unrecognizable. If matters progress as far as this, the organism is deprived of its last mode of action—i. e., expulsion—owing to the increasing pressure of secretion behind the foreign body. The pent-up secretion is pathologically increased, becomes purulent, and soon leads to

bronchiectatic dilatation, which, however, does not extend usually above the point of retention. A local destructive process by which the foreign body might free itself is so rare that the possibility of it practically plays no part."

The above clear exposition of Brunings as to the causes of retention of foreign bodies in the trachea and bronchi is deserving of a place in a monograph of this character. In connection with it, the writer wishes to mention some reports of very remarkable expulsions of foreign bodies which have been recorded from time to time and which tend to upset the claims of certain bronchoscopists that retained foreign bodies result fatally within two to five years. In looking over the literature it is an interesting fact that certain observers have recorded cases in which the foreign body had lain in the trachea or bronchi for from one to sixty years; all recovered after removal or expulsion. Pieces of bone, coins, pins and nails have been found in the air passages where they had remained for years without causing symptoms.

Symptomatology of foreign bodies in the air-passages. Usually the first symptom when a foreign body is inspired, whether it lodges in the larynx or passes into the trachea, is a severe coughing spell which may or may not be accompanied by more or less cyanosis. If the object is large, the attack may approach suffocation or even result in death before medical aid can be secured. The writer remembers the case of a drunken man who attempted to swallow a soft crab without sufficient mastication; the bolus lodged in the larynx and cyanosis rapidly supervened. Only the promptest medical aid saved his life. In another case which came under the writer's observation, a large piece of ham slipped over the epiglottis and lodged in the esophagus. If the object lodges in the larynx, the first symptom is cough, usually violent in character, followed almost immediately by cyanosis. In the case reported above of a piece of bone which lodged between the cords, the symptoms were explosive cough and marked cyanosis; after these symptoms subsided, the patient could only whisper and coughed occasionally, but, strange to say, breathing was not affected as late as four days after the accident. If the foreign body slips into the trachea or bronchi, there is nearly always a severe paroxysm of coughing, which is nature's effort to expel the offender. There may or may not be cyanosis. After the first paroxysm there is often a period of quiet, which may be punctuated with an occasional cough; there may not be any symptoms in this stage which would indicate that a foreign body has been aspirated. In

some cases symptoms are severe from the beginning, such as severe and frequent cough, cyanosis, more or less dyspnea and bloody expectoration. Paroxysms of coughing are occasionally so prolonged that the little patient is rapidly exhausted. In the next stage, which varies in duration a few days to a longer period, there may be secretion of large quantities of frothy blood-tinged mucus or fluid, which is practically always swallowed by children and voided in the paroxysms of coughing. One case has been reported in which repeated hemorrhages were observed until a nail which had been in the bronchus two years was coughed up. In most cases no pain is complained of; in a patient seen by the writer, pain was experienced as the result of the jolting of a sleeping car. In small foreign bodies no increase of the respirations may be noticed, but usually sooner or later this symptom is observed. In the writer's experience, inspiration is more often affected than expiration, especially in foreign bodies which have the quality of swelling, such as beans, grains of corn, etc. Marked dyspnea is not often seen unless one bronchus is entirely cut off and in some of these cases it is surprising how well the patients breathe. Occasionally the picture presented by a swollen foreign body is distressing; the child shows all the evidences of suffocation in that he assumes a sort of crouching position, the auxiliary chest muscles are contracting, the entire chest is heaving, the alae nasi are dilated, the face has an anxious expression and the skin is blue from the deficient aeration. This stage is, of course, the extreme one and fortunately rarely seen. In nearly all cases fever sooner or later makes its appearance and when there is no history of the aspiration of a foreign body, the additional symptoms of gradual loss of weight, cough, expectoration, especially of blood-tinged secretion, progressive loss of strength, night sweats, increase of respiration, shortness of breath make a perfect picture of tuberculosis. It should be remembered, however, from a diagnostic standpoint that in foreign bodies alone, tubercle bacilli are not found in the sputum, so that the combination of a part or all of the above mentioned symptoms with the presence of bacilli should always arouse the suspicion of a foreign body. Such cases have reportedly been diagnosed as tuberculosis and the patient given treatment for that disease. The writer has recently heard of a case in one of our leading hospitals which illustrates the truth of the above statement. A child was admitted with most of the symptoms enumerated above, she was examined and a diagnosis of tuberculosis made; X-ray pictures taken an-

ten days later showed no light of the case. After having continued to worsen, the case was taken to another hospital and the Röntgenologist took pictures antero-posteriorly and laterally with the result that a closed saddle aneurysm was located in the trachea. The removal of the aneurysm was followed by a speedy restoration to health. Such cases are not uncommon. In cases where the foreign body is small, quite often there may be no symptoms for a long time and in such cases the object has remained quiet for many years. In a case reported by Kellek, the inspiration of a bean caused suffocative paroxysms of twenty minutes, after which there was a period of quiescence nor fifteen hours severe pains in the chest then came on accompanied by cyanosis, dyspnea and paroxysms of coughing. Chest examination showed impaired respiration, rattle respiratory murmur, deficient expansion and moist rales over the entire left lung, which indicated obstruction of the left main bronchus. In a case reported by Compad, a boy, 7 years old, aspirated a piece of husk. Paroxysms of suffocative coughing were followed by fever, chills and pain in the left chest. The paroxysms were accompanied by bloody, then purulent, fetid expectoration. As was to be expected, the X-ray picture showed nothing. When the bronchoscope was passed, large quantities of pus were found and during the examination the husk was found in the lumen of the bronchoscope probably washed up by the pus. In a case reported by Clayton, a boy, 12 years old, had chills, fever, and cough with expectoration of blood from obstruction of one of the right bronchi by a peanut. Recovery without treatment of any kind resulted from the breaking up and coughing out of the particles of the foreign body. The writer wishes to emphasize the fact that too much dependence must not be put upon lack of symptoms; the most difficult cases to diagnose are those which show practically no symptoms or possibly a slight cough. In such cases if there is a possible history of the aspiration of a foreign body, the X-ray should be used, and if this fails to give information as it will in certain substances, one is justified in making a careful bronchoscopic examination.

The physical examination. The examination of the chest physically yields valuable information, provided the suspected foreign body is large enough to cause any material obstruction. Thus a body which is well placed can be felt in the axilla, may practically be seen in the trachea in a child, or a smaller rounded object can be felt on the air from an area supplied by a smaller bronchus. In such cases it

is not difficult to determine that air does not reach the lung. In other cases where the object is small and pointed like a pin or hollow or perforated like a bead, considerable air may enter the lung so that auscultation may not be of much help as far as the mere cutting off of air is concerned. If the bronchus obstructed be very small, no information can be gotten from the physical examination because the adjacent parts of the lung undergo a sort of compensatory hypertrophy or dilatation which overshadows, so to speak, the affected area. If the obstruction is in one of the larger bronchi, according to the site and grade of obstruction, there will be dullness, diminished or absent vesicular murmur, diminished fremitus and possibly limitation of chest movement on the affected side. If the lung around the obstructed area is dilated, percussion will not give much information of value, if one find normal resonance with absent vesicular murmur and other symptoms, the presence of a foreign body is strongly suggested. If the obstruction is great, the respiratory murmur may be raised in pitch; the same thing happens if the object is a bean or a grain of corn from swelling of the body. In a case reported by Angeleis, in which the foreign body happened to be a whistle in the right bronchus, a whistling sound produced by the rushing of the air current was heard 15 metres from the chest wall. Sooner or later the presence of the foreign body will set up inflammation of the mucous membrane of the bronchus; then subcrepitant rales will be heard over the affected area. It will be seen from the above mentioned signs that physical examination is of great help in some cases and of doubtful value in others.

Pathological changes produced by foreign bodies.

It can be readily understood that if a bronchus is occluded by a foreign body, the adjacent and even remote lung areas will undergo a compensating dilatation with the formation of a vicarious emphysema, which is due to the yielding of the walls of the smaller bronchi, the bronchioles and the lung alveoli. When obstruction is only partial, the air passes in and distends the bronchi and fills the alveoli, but air cannot pass out as well because of the obstruction and the inflammatory swelling of the mucous membrane with the result that the walls are stretched or dilated. Soon the muscular layers of the walls lose their tone from the inflammation of the membrane and the walls themselves are weakened so that they can no longer resist the force of the air pressure. If complete obstruction occurs so that no air can get into the affected area, collapse of that part of the lung or atelectasis follows; this

is followed quickly by bronchiectasis because the inflammation extends from the membrane surrounding the foreign body to the atelectatic membrane which is still supplied with blood. The inflammatory area naturally leads to increased secretion in the collapsed lung. According to Lichtheim this form of bronchiectasis is the result of an inflammatory process within a partially atelectatic lung. If there is no inflammation, no bronchiectasis takes place and the air is simply absorbed in about 24 hours. In the beginning the inflammatory process is localized around the affected bronchus at the site of the foreign body but it soon extends to the lung vesicles, producing the essential changes of a bronchopneumonia with inflammation of the mucous membrane, localized consolidations, bronchiectasis, pleurisy, exudative or plastic, and atelectasis; the diseased process does not tend to resolve so long as the foreign body is not removed or coughed up but becomes an interstitial pneumonia with abscess formation in about 10 per cent. of the cases. The abscess may connect with the affected bronchus from the beginning of its formation or it may form at a distance and perforate into the bronchus. Cases have been recorded in which the foreign substance has been expelled with the pus during a paroxysm of coughing. One of the end products of a bronchopneumonia due to foreign bodies is the gangrenous degeneration of the inflammatory products. Such a process may affect a part of the lung previously healthy and give rise to the characteristic odor of the breath, expectoration of shreds of necrosing lung tissue and possibly hemorrhage which is present in about one-fourth of the cases and may be so profuse as to cause death.

As a result of the pleuritis, empyema may form or it may possibly be caused by perforation of the lung by the abscess or the foreign body or both. In such cases the foreign body lies free in the thorax. In one case an autopsy showed a body in an empyema thirteen years after aspiration. Pneumothorax may develop as a result of the lung perforation; the same condition may also be brought about by the strain upon the unaffected lung by violent coughing efforts in impacted foreign bodies. Usually, however, the abscess ruptures into the thorax with the formation of pyopneumothorax. In a case reported by Ast, a girl, four years old, aspirated a pebble; this was followed by adhesive pleurisy with serious broncho-pneumonia and perforation with pneumothorax on the eleventh day. When a foreign body is removed or coughed up, the pathological processes quickly clear up even though they may have existed a long time. If the

can often be prolonged some years. 7. Jackson has given another indication in the removal of thick secretion in certain cases. Adults are usually able to cough secretions up, but in children, weakened by illness, excessive or thick secretion will cause them to drown in their own secretions, according to Jackson. In these cases, bronchoscopy is particularly valuable for getting rid of this danger.

Contra-indications to tracheo-bronchoscopy.

These are practically the same as for direct laryngoscopy and will not be repeated here. It goes without saying that one should be even more careful in his selection of patients for bronchoscopy because the examination is longer and a greater strain on the heart and blood vessels than direct laryngoscopy, which takes only a few minutes in most cases.

Dangers of tracheo-bronchoscopy. It may be said that the examination under local anesthesia or without anesthesia of any kind is *practically* without danger. Most bronchoscopists teach that if one can get the bronchoscope in the trachea there is no danger of suffocation. They claim that the greatest danger is in passing the tube into the trachea when the patient is under general anesthesia. The writer wishes to say that he considers every step of the procedure dangerous to a certain extent and that he never undertakes an examination under local or general anesthesia without seeing that a stout tongue depressor, mouth forceps and a tracheotomy set are within reach. For some years in passing the bronchoscope hundreds of times he had no trouble. Then two accidents which happened in a short period of time proved to him that one must always be prepared for any emergency in tube work. Strange to say, both of these accidents happened with the bronchoscope in the trachea in examinations under local anesthesia. They were so sudden and so unusual, they will be described. In a nervous girl, 25 years old, there had been a stubborn cough and expectoration of long standing. Nothing was found in nose, throat, or lungs to account of the trouble, so a bronchoscopic examination was decided upon. At the Presbyterian Hospital, after a hypodermic injection of morphine (1/8 gr.) and atropine (1/150 gr.), she was examined in the sitting position under alypin anesthesia. The larynx was large and the bronchoscope was passed without difficulty. Aside from slight nervousness the patient stood the procedure well. The writer had located the diseased condition in the trachea and was preparing to make an application of nitrate of silver when, without warning,

the patient began to shake and became cyanotic. It looked as if she were having a nervous attack and, if the tube were removed promptly, she would recover immediately. When the writer attempted to withdraw the tube, he found that the patient had shut down on it with her teeth. He called to her to open her mouth, and when she did not do so, he realized that she was unconscious. In the meantime she was becoming more and more cyanotic. It was a difficult matter to hold her head back; Dr. William Caspari, who happened to be present, rushed up and forced her mouth open so that the tube could be withdrawn. The patient was then lowered to the floor, as blue as indigo, without pulse or respiration. To all appearances she was dead. Artificial respiration was resorted to and strychnine, whisky, and digalin given hypodermically. With this treatment the patient slowly rallied and in an hour was almost in a normal condition with the exception of weakness which kept her in bed two days. Had it not been for the prompt assistance of Drs. Caspari, Reckard, and Dodd, recovery would not have been possible. Careful inquiry failed to bring out similar attacks. The patient had a spasm of all the chest muscles, which entirely shut off respiration. With the tube in the trachea, it is scarcely possible that suffocation could have been caused by anything else.

The second case was a man who had submitted to bronchoscopy a number of times without difficulty of any kind. He was of a phlegmatic temperament and did not mind the use of cocaine in more than the average quantity. On one occasion when the 9-millimeter bronchoscope was in his trachea, he suddenly fell off the stool and became cyanotic. As in the first case, unconsciousness came quickly. In this case there was a tracheotomy wound and he was never in the condition of the first patient. He was placed on the floor, with pulse and respiration gone. The same measures were adopted as in the first case and he soon recovered consciousness. He was put to bed and the next day was perfectly well, but could not recall anything that had happened. In both of these patients the tube was in the trachea and both were breathing naturally and were apparently in good condition when, without warning, the chest muscles seemed to become paralyzed, the pulse stopped almost instantly and extreme cyanosis came on. Both patients looked as if they had lost all oxygen in their lungs in the space of a minute. The writer has never been able to explain the conditions to his own satisfaction. Both patients looked as if they were dead and only the promptest work saved their lives. Since these accidents a

and peels off the pleura very much after the manner of De Lorme; but he takes extreme care in freeing the lung from any adhesions that may be preventing expansion, and does not hesitate to resort to packing of the cavity, relying on the lung exercises to complete the expansion, reducing the packing day by day and thereby securing a gradual distention.

The extensiveness of these methods and their attending high mortality, led me to evolve a more simple and less formidable procedure.

A thoracoplastic window of moderate size is made and the most collapsed portion of the lung is sought. A longitudinal incision is made over this area through the thickness of the pleura and with the aid of my especially designed spatula, the pleura is detached from the lung proper for an area of 3 or 4 inches, but is not stripped from the lung.

The adhesions between the visceral and parietal pleura must be separated. This being done, the entire pleura covering the collapsed lung is then incised by numerous cuts throughout the collapsed portion and detached as before by the aid of the spatula and finger but not stripped off and removed.

The expanding lung pressing against its own visceral covering will thus securely prevent the bleeding that is so prominent with the other methods. At the same time the expansion is not all retarded by the formation of an intrathoracic clot, as often happens in the cases in which typical decortication is done. The liability of infecting the lung tissue is with this method obviously diminished and principally the adhesions between lung tissue and parietal pleura are effectively prevented.

It is these adhesions that give the patients cured of empyema the dull persistent pleuritic pain that annoys them almost constantly.

In avoiding the decortication proper and its attendant bleeding the shock is very much minimized and the mortality diminished.

The after-treatment in these cases is no less important than the operation. Breathing exercises are very essential and should be instituted as soon as the wound is healed. The two-bottle apparatus is by far the most simple and effectual means of carrying on the lung gymnastics.

The liability of pneumothorax occurring in these cases, either at the operation or in the first few days following it, is less than in the ordinary rib resection for drainage, as there is with decortication practically no cavity that may fill up with air.

In all cases that I have applied this type of decortication the results have been excellent. I wish to

make very plain that the results that I have obtained with the method of De Lorme and Biondi have been equally as good as with my own method. The only points of preference that I could claim for the procedure here advocated is that it diminishes the shock, prevents profuse bleeding, lessens the liability of infection and thus lowers the mortality rate of a formidable operation.

There is a class of cases where my method would prove insufficient.

Where the hyperplasia of the pleura is advanced to such a degree that the thickness of this membrane is of one inch or more, I believe that the radical decortication, by De Lorme's technic, is the procedure of choice. For the control of the hemorrhage, I advise that the tamponade be made very loosely, and removed on the next day. Secondary bleeding, if it occurs, will, in most instances, be very insignificant.

Lung decortication, when properly carried out, is the only positive remedy we possess in the radical cure of chronic recurring empyema.

A SIMPLIFIED APPARATUS FOR PERFORMING PYELOGRAPHY.

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The cognizance of the exact anatomical and pathological state of the kidney and the ureter before operation is of such vital importance that of recent years Voelcker and von Lichtenberg were led to devise a method for obtaining the outline of these two urinary structures by filling the renal pelvis and ureter with a solution opaque to the X-rays and then taking a radiogram. The agent in common use in carrying out this procedure is collargol in solutions varying from 5 per cent. to 12 per cent., depending chiefly upon the corpulency of the individual—very obese patients requiring more concentrated solutions than thin subjects. It still remains a disputed question among urological authorities as to whether or not collargol *per se* exerts any harmful effect upon the kidney. Braasch, of the Mayo Clinic, who has probably done more of this work than any other American urologist, recently reported a series of 1,000 cases in which pyelography had been performed without one fatality or permanent injury.

It seems hardly necessary to repeat here that, in performing pyelography, the *gravity method* of employing collargol (and solutions of similar opaque

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WALTER M. BRICKNER, M.D., Editor

NEW YORK, OCTOBER, 1914.

ANOCCI-ASSOCIATION.

The profession is, we believe, quite familiar with Crile's studies of shock and the evolution from his earlier vasomotor to his present kinetic theory, with his epochal work on blood transfusion, and with his efforts to establish shockless surgery by the application of his kinetic theory in "anoci-association." His recently published book* is a restatement of these familiar publications, as a very clear, logical exposition; and it is both important historically as a monograph and highly instructive and entertaining as a classical presentation of a surgical development that, in any event, is stimulant of clinical and physiological research.

If Crile's anoci-association fails to attain permanency in its entirety it will still have done an enormous service in impressing the importance of shielding surgical (and medical) patients from those unfortunate psychic impressions which in our routine hospital work we all too often unwittingly inflict—the careless remark by the surgeon, the nurse or the interne, the heedless shrug of the shoulder or the to-the-patient very significant lifting of the eyebrow, or, what is often as bad as saying too much or saying awkwardly, the failure to explain and to reassure. Let any patient discharged from a surgical hospital ward recount his experiences. He will tell of his fright as he saw patients returned from the operating room swathed in bandages and

noisy with the delirium of semi-consciousness, of his anguish as he beheld the flurried preparations for the treatment of a sudden hemorrhage or collapse in a neighboring bed, of his fear for his own recovery when he finds that bed emptied by death, of his hours of tormenting anxiety concerning the to-him cryptic comment or the equally panic-breeding failure to comment, of the attending surgeon on his rounds. He will tell of the dread moment when, after he had been unexpectedly and painfully pricked in the arm with a needle, he was carried into the anesthetic room, amidst the disturbing sounds of hissing sterilizers and rattling basins and the confused hurrying to and fro of white-gowned doctors and nurses. He will recount that he heard someone in the hall say, "Which is that bum cardiac I've got to push the dope for?" and that then the interne rushed into the room with the black rubber bag. He will dwell on that moment of supreme and exquisite anguish when, with a despairing sense of drowning, the mask smothered his face and strange sounds came more and more distantly to his ears. He will recall, with an unpleasant expression, how disagreeably the anesthetist's fingers smelled, or even tasted, of tobacco; and he will startle you by repeating some unguarded remark made by one of the staff just before his senses sank into the abysmal depth of blessed narcosis. He will tell how he was awakened in his bed by the pressure of a large mountain balancing on the pit of his stomach, and the noise of ten thousand assorted devils beating an anvil chorus in his wide-open calvarium!

Few hospital patients escape these or other distressing experiences. Most patients are able to survive them cheerfully—else our highly cultured nations would not now have soldiers to shoot one another and, being wounded, to return and shoot again. But not all men and women are so phlegmatic or so well prepared for such a hospital ordeal that they can pass through it unharmed. On the timid and sensitive these psychic traumata sometimes work serious, even permanent, injuries. It is not hard to believe that occasionally, at least, they may be contributive to surgical shock and that they may oftener add to or originate a post-operative neurasthenia. Irrespective of these sequelae, however, Crile's effort to minimize, in surgical work, all physically painful contacts, is an humane example that all hospital physicians ought to follow.

Beyond this it remains to be demonstrated whether Crile's operating details of technic in anoci-association will permanently survive as a means of preventing surgical shock, scientifically considered.

*Anoci-Association. By Crile and Lower. See book reviews, this issue.

Surgical Sociology

Ira S. Wile, M. D., Department Editor.

WAR THOUGHTS.

The war of nine nations still rages. The forced marches, the storming of citadels, the destruction of railroads, the burning of cities, the capture of cannon, the rescue of the wounded, and the burial of the dead continue to yield their columns to the daily press. Disease, disability, and destruction accompany the cohorts of the marching foes, regardless of uniform, flag, or form of government. The cost of this momentous struggle has been estimated at from twenty-five millions to fifty millions of dollars a day. Such theoretic approximations include the cost of destruction of towns and help to the poor further impoverished through war.

The American Civil War cost \$8,000,000,000. Approximately 900,000 lives were sacrificed from wounds and disease. The Franco-Prussian War cost \$3,000,000,000, the Russo-Japanese War cost \$1,735,000,000.

The mere citation of these stupendous figures fails to indicate the social loss attendant upon the warring nations. The cost of slaying an individual man in battle has been reckoned by Dr. Trueblood as averaging \$3,677, utilizing the figures available since the beginnings of authentic history.

The efforts of modern medicine have been directed toward the conservation of human life and the protection of the race against the invasion of pathogenic foes. The cost of saving and protecting humankind from unnecessary death, preventable accidents, needless mutilations, and violent deaths is an insignificant figure, particularly when contrasted with vast expenditures required for the forces of destruction.

It is unfortunately true that the industrial army is battling against unnecessarily destructive conditions so that to-day probably 35,000 American workmen are killed yearly by industrial accidents. The endeavor to stem this torrent of needless disaster is constantly increasing. It may seem futile to concentrate effort, attention, and money in limiting accidents and deaths while the example of foreign nations in ruthless destruction appears to be the dominant feature in the present world history.

As a neutral nation, our efforts must be devoted to the preservation of our citizenship. The allies of peace and prosperity must redouble their vigor to maintain the welfare of the community. The ensuing year will be exceedingly enervating owing to the indirect influence of the war. With the practical halting of 60 per cent. of our exports and imports, the economic situation in this country is already going through a critical period. Strong governmental backing, calm, dispassionate, and clear-sighted decisions are necessary for the maintenance of financial integrity. The taxation of the community will be increased on all sides and as a result there will be a decrease in the normal funds available for charitable institutions. With the de-

pletion of business, there will be more unemployment, there will be an increase in poverty, and probably the effects of disease will be more widespread and of more serious moment than under conditions of general physical welfare. Hospitals and dispensaries undoubtedly will be called upon for additional service by those who heretofore have managed to keep above the line of medical dependence.

With the outpouring of funds for Red Cross activities in other lands, there will undoubtedly be a falling off in the gross amount of charitable funds available for distribution to institutions of all kinds including those devoted to medical and surgical relief. Judging from the slowness with which funds have been offered to the Red Cross, the American people have not felt deeply the usual call for assistance nor have they entered into it with their wonted sympathy and understanding.

In the midst of the struggle of foreign lands, it must not be forgotten that America has a duty to perform to its own citizens who undoubtedly have a greater need for relief than in many decades. The war problems of this land at peace are deeply significant and their solution will require sagacity, judgment, cautiousness, together with unusual liberality on the part of the supporters of the institutional phases of our national life.

The sacrifices in Europe upon the altar of Mars will not be atoned within a generation. The United States for a long period to come will represent the natural source of provender, industrial assistance, and financial support for the great proportion of the civilized world.

In order to maintain the position of neutral pre-eminence, in order to be of the maximum assistance in rectifying the social damages resultant from war, it is incumbent upon this country to retain the solvency of every type of industry and to maintain in a condition of practical efficiency every institution now existent for the public welfare. Medical institutions have weightier responsibilities upon them. Restoration to health must be more certain, inasmuch as home conditions will rapidly undermine health, unless it has been placed upon a sound plane. The organization of medical work, therefore, demands more system in order to promote greater social efficiency. Medical economy is not essentially medical efficiency. Economy, however, will be required in order to promote the welfare of the greatest number in view of the fact that it will be more difficult to secure the funds necessary for the ever-increasing budgets of American hospitals and dispensaries.

The few Red Cross units which have gone over to give relief to the contending armies represents the spirit of the medical profession. Medicine recognizes no nationality, nor any other of the artificial divisions made by the mind of men. It seeks to serve the world and strives to enrich it. Its constant career is a war, but it is a battle of peace and its losses largely represent the foes of mankind. Its destructiveness results in the upbuilding of nations and its defeats retard the progress of humanity.

Progressive Medicine. Edited by H. A. HARE and L. F. APPELMAN, September 1, 1914. Philadelphia and New York: LEA & FEBIGER.

This number contains the following reviews: Diseases of the Thorax and its Viscera, including the heart, lungs and blood vessels, by Wm. Ewart; Dermatology and Syphilis, by W. S. Gottheil; Obstetrics by E. P. Davis, and Diseases of the Nervous System by W. G. Spiller. As customary, these reviews of the recent literature in their respective subjects, are able done. They reveal a wide knowledge of the best articles, careful review of the text and a sound critique.

Progress in Surgery

A Résumé of Recent Literature.

Diagnosis and Treatment of Hemic Infections of the Urinary Tract. F. KIDD, London. *The American Journal of Urology, Genereal and Sexual Diseases*, August, 1914.

This paper is based upon the study of a series of cases, excluding tuberculosis, over a period of about four years. In a patient suddenly seized with pyuria and fever, the treatment should be absolute rest in bed for at least a week after fever has disappeared. The usual methods of diuresis and diaphoresis are employed. In the meantime the methods of diagnosis are instituted. First a catheter specimen is sent for bacteriological examination. The group of hyperacute and possibly fatal cases is a very small one; it is only in those very instances that a prompt nephrectomy is to be practiced, and then not until it has been demonstrated that the affection is unilateral. In the large majority of the cases the acute symptoms abate under conservative measures. When fever disappears skiagrams should be taken to exclude renal calculus, the urine catheterized from each kidney should be examined bacteriologically, and, if necessary, collargrams of the renal pelvis should be taken. At the end of another week urethral catheterization should be again practiced to determine if the case has been cured. If still infected the catheter should be left in place in the pelvis of the diseased kidney and, irrigations with oxyganide of mercury (1:4,000) practiced at frequent intervals. Another method is to catheterize the ureter every fourth or fifth day, and wash the pelvis with a collargol solution. Very few cases fail to yield to either method of treatment.

The general treatment of the chronic cases that are left is of greatest importance, for these patients have very low tissue resistance. They must be built up and most carefully avoid overexertion. Daily bowel movements are to be insisted upon. Urotropin is administered constantly. Only 6 per cent of the cases are left uncured by this treatment. It is for these cases that nephrectomy should be reserved after the condition is proven unilateral and the opposite kidney capable of adequate function.

The Redundant Sigmoid. C. A. L. REED, Cincinnati. *Journal American Medical Association*, Aug. 8, 1914.

A sigmoid over ten inches in length is considered by Reed, as redundant. So far he has not seen one exceeding that measurement that was not the seat of either functional or organic disturbance logically attributable to redundancy. There may be exceptions but he has not met with them. The sigmoid is in close anatomical relation to important parts which may be affected by its increased size, hence the surgical significance of the condition. It is probably true that in the normal individual its function is to delay the too rapid transit of intestinal contents, and the tendency of increased size must be toward fecal stasis. We must also recognize that it has an active absorbent apparatus and is the seat of an abundant flora, and that toxins develop in the long-retained contents. These facts indicate its functional importance. Of the cases operated on by him in all but a comparatively few, redundancy was an important if not the sole abnormal con-

dition. These cases, he says, represent less than 50 per cent. of the cases referred to him for operation, the remainder having been treated by other methods. The symptomatology of redundant sigmoid is variable; probably the most common symptom is constipation, liable to alternate with diarrhea and associated with colicky pains. There are also more or less pressure symptoms in the prostate or ovary and elsewhere, and cystic irritation. Physical examination generally reveals dullness in the left lower quadrant. The conclusive examination is, of course, by the Roentgen ray in the hands of an expert, and Reed recommends as rules to be observed first, a complete emptying of the large bowel and which should be completely filled with the barium solution and pictures taken in the recumbent, erect and extreme Trendelenberg posture. The local sequelae are sigmoiditis and pressure lesions of other organs and the remote or systemic results are brought about through the blood and the nervous system. The toxins developed are carried away by the blood and the sensory centers are made still more sensitive by them to the pain caused by the pressure conditions. Other existing pathologic conditions are aggravated by the toxemia and several cases are mentioned illustrating this fact, such as melancholia, nephritis, nutritive and neuropsychic disturbances, etc. The situation, Reed says, may be summarized by the statement that any systemic or even local disease, deleteriously influenced by impaired nutrition, must necessarily have an important sequent relationship to coexistent redundancy of the sigmoid and colon. As regards treatment, palliative measures may be relied on in a limited number of cases to afford a *modus vivendi* without affecting the original causative condition. The methods mentioned are postural treatment with massage, laxative foods and, if necessary, mild laxatives, though it is better to get along without them, hydropathy and enemas. Contrasted with the palliative treatment are curative methods and nothing is really curative but surgery. The measures he has found effective are: sigmoidopexy, ileosigmoidostomy, cecosisigmoidostomy, resection of the sigmoid and as a secondary procedure to ileosigmoidostomy-colectomy. It is important as regards sigmoidopexy, Reed says, not to stitch the sigmoid or any part of it to the abdominal wall, but that the unkninking should be effected by stitching not the bowel itself but the redundant mesosigmoid to the parietal peritoneum. Where fixation methods cannot be effective, resection of the sigmoid with lateral anastomosis of the ends, or ileosigmoidostomy, or cecosisigmoidostomy, after the manner of Rilus Eastman, with or without resection or removal of the large bowel, may well be employed.

A Report of Twenty-Seven Unilateral Exclusions of the Pyloric Region, With Special Reference to Operative Technique. WILLARD BARTLETT, St. Louis. *Journal American Medical Association*, Aug. 15, 1914.

W. Bartlett says that our knowledge of ulcer of the stomach and duodenum is so meager at present that we cannot do more than temporarily to relieve the anatomic condition which is the expression rather than the origin of the disease. Closure of the pylorus cannot protect the gastric ulcer near it even with the gastro-enterostomy, since the pyloric antrum drives stomach contents as far as possible toward the closed pylorus before letting it enter the new opening. Gastro-enterostomy alone seems to have done less good the farther from the pylorus the stomach lesion has been found. His experience with unilateral exclusion of the affected area has been in most cases satisfactory. It takes the place of excision of gastric ulcer, or pylorotomy where the latter presents extreme technical difficulties. A larger ulcer perforating deeply into the structure of the pancreas, liver or other organs is most simply treated by exclusion. Bartlett says: It prevents the gastric contents passing over an ulcer; stops pain, prevents hemorrhage and puts the excluded portion at rest, allowing the ulcer to heal, thus decreasing the likelihood of secondary cancer. Any form of exclusion of the pyloric antrum which prevents food passing over it accomplishes as much as does complete transverse division of the organ. Cohnheim teaches that the innervation of the stomach and pyloric musculatures is chiefly gov-

every variety of cancer tissue in the uterus yields to the curative influence of the ray in the course of three to five weeks, some showing a quick and others a slower reaction. Injurious effects from the ray action are becoming, thanks to the improved technic, more and more reduced. Their importance when compared to the absolute danger of the underlying disease is not to be seriously considered. In operable cases, radiotherapy is fully justified as an alternative to the radical extirpation. Further experience will teach us the best form of irradiation to adopt in the cure of cancer, whether the x-rays or the radium or mesothorium.

The final word as to the value of these therapeutic agencies must wait the observations and experiences of the coming three to four years. Only then shall we be in a position to know whether we possess in radiotherapy only a temporary measure against cancer, or whether it may prove to be the curative agency against that dread disease.

In the metropathy (metritis chronica) radiotherapy has come to have a distinct value; also in the treatment of fibromyomata of the uterus. All the applied forms of irradiation have proved of value. Hemorrhage is controlled even to the point of temporary or permanent amenorrhea and in many instances a disappearance of the growth. But as Martin remarks, we are still in need of further observation and control of the cases treated to determine especially the possibility of untoward effects of a serious nature. Meanwhile the technic for myoma has been so perfected that the mortality from the operation in the hands of many has been reduced to zero.

Pyelitis of Pregnancy. (*Über Pyelitis Gravidarum.*) A. BAUERREISEN, *Jahreskurse für Ärztliche Fortbildung*, July, 1914.

The mode of infection of the renal pelvis is either ascending from the bladder—a theory which Stoeckel, Opitz, Kehler and Menge and most German authors support—or it is descending, the infection coming through the lymphatics or the blood stream into the kidney capsule and thence into the renal pelvis. The latter theory is chiefly advanced by Albarran and Zangemeister and most of the French authors. According to Bauerreisen's own experience the infection is most probably in the majority of instances an ascending one. The growing uterus exerts direct pressure on the ureters, causing stasis, which is the strongest predisposing factor in infection, or by intestinal stasis develops secondary urinary infection. The bacilli coli communis is present in the urethra and bladder in 19 per cent of pregnant women. This fact alone would tend to explain the readiness of the b. coli infection. Streptococci and staphylococci are less common, while the bacillus proteus, the gonococcus and pneumococcus are also occasionally found.

In the therapy of the pyelitis, the cystoscope and the ureteral catheter are the most essential means of determining in the first instance whether one is dealing with merely stasis, or also with an infection. In mild cases of stasis without associated infection, the ureteral catheter used for diagnostic purposes may at the same time bring about a cure. Rest in bed and regulation of diet complete the recovery. If bacteria and pus are revealed by the cystoscopy, no time should be lost with conservative treatment, but as soon as possible lavage of the renal pelvis should be begun. Since Stoeckel's recommendation of this therapeutic measure most authorities have supported it. Bauerreisen believes it to be the method of choice in the treatment of pyelitis of moderate severity. The proper and timely use of the ureteral catheter will not only obviate the necessity of interrupting the pregnancy, but it can also prevent those bad cases of pyonephrosis. The cases of moderate severity may be cured also, thus reducing the number of spontaneous early miscarriages.

The interruption of pregnancy, according to Stoeckel, does not relieve the alarming symptoms of the pyelitis, hence it is not to be employed. An important factor is the early diagnosis of the existing pyelitis.

In protracted and mismanaged cases of pyonephrosis neither the artificial abortion or lavage of the renal pelvis

will be of avail. In these instances the indication is purely surgical, namely, for nephrotomy or for nephrectomy.

The Ovary in Women With Fibromyoma. (*L'ovaire chez les fibromateuses.*) M. DE JONG, *Annales de Gynecologie et d'obstetrique*, June, 1914.

De Jong has studied the ovaries of 13 women operated upon for fibromyomata of the uterus and has also reviewed observations on this subject in the literature. Her conclusions are as follows: 1. The evolution of the interstitial gland is very variable in women with fibromyoma, both as to the number of the atretic follicles and as to the presence of a corpus luteum of menstruation. 2. The corpus luteum of menstruation is an inconstant formation in the ovary of the fibromyomatous uterus; it may be double.

In 6 cases this formation was absent.

In 5 cases it was present (1 case had an arphorectomy 18 years previously.)

In 1 case there was a corpus luteum in each ovary.

In 1 case there were 2 corpora lutea in the same ovary. These differences bear no relation to the age of the patients.

At the same time these facts would tend to disagree with those theories which suppose that the ripe follicle ruptures regularly twelve or fourteen days before the menses. The corpus luteum of the normal ovary is not to be distinguished from that of an ovary in a woman with fibromyoma. On the other hand, it is incontestably true that the ovaries play a rôle in the uterine hemorrhages of fibromyomata.

Five Cases of Pregnancy Following Myomectomy. (*Cinq Cas de Grossesse après myomectomie.*) M. GOULLIQUET, *Annales de Gynecologie et d'Obstetrique*, June, 1914.

Of 26 women in whom a conservative myomectomy was done, five became pregnant and went to term. These women were all below 40 years of age. The percentage of pregnancies in such patients would be about 20; in women over 35 years, the possibility of pregnancy after a myomectomy is very much less. Goulliquet operated on young women, some of whom were still unmarried at the time of the operation. There were a few miscarriages after the operation, but these occurred in women who had previously miscarried, the cause probably being outside of the uterus. There were no fatalities during labor, the possibility of a rupture of the uterus having been prevented by a careful repair of the uterus at the removal of the fibromyoma.

In some cases, after the pregnancies, there was a recurrence of a myoma. In these instances the radical operation was then performed.

The Use of Pituitary Extract in Labor. D. G. MADILL, M.D., and R. M. ALLAN, Dublin, *Surgery Gynecology and Obstetrics*, August, 1914.

The authors conclude that pituitary extract undoubtedly increases the strength of the uterine contractions, the contractions being of a physiological character. The best results are obtained in the second stage and the use of the extract reduces the number of forceps cases. It is safe for the mother and at least as safe for the child as the forceps. In cases of placenta previa, it gives improved results for both mother and child if used in combination with version. It does not influence the puerperium.

Sarcoma of the Round Ligament of the Uterus. FRED. J. TAUSSIG, St. Louis, *Surgery, Gynecology and Obstetrics*, August, 1914.

Taussig reports his case as the sixth substantiated case in the literature. The tumors are of slow growth and not very malignant clinically. Metastases are not recorded nor have recurrences been noted. The tumors are mostly extraabdominal and usually originate in a fibromyoma. In Taussig's case there was no evidence of a previously existing benign growth.

Calcified Fibroma Uteri Compressing the Sigmoid Colon. *Journal of the American Medical Association*, August, 1964

There is a lack of uniformity in this kind of tumor, and the behavior of the tumor is determined by the histologic pattern of the tumor. The tumor is composed of a mixture of spindle-shaped cells, some of which are arranged in a fascicular pattern, and some of which are arranged in a nodular pattern. The tumor is composed of a mixture of spindle-shaped cells, some of which are arranged in a fascicular pattern, and some of which are arranged in a nodular pattern. The tumor is composed of a mixture of spindle-shaped cells, some of which are arranged in a fascicular pattern, and some of which are arranged in a nodular pattern.

Dysmenorrhea: Essentials. *T. J. Donovan, M.D., New York, N.Y.*

Dysmenorrhea is the most common gynecologic complaint. It is a condition in which the menstrual pain is severe enough to interfere with the normal activities of daily life. The pain is usually associated with the menstrual cycle and is often accompanied by other symptoms such as nausea, vomiting, and diarrhea. The pain is usually associated with the menstrual cycle and is often accompanied by other symptoms such as nausea, vomiting, and diarrhea.

Polypoid Chondromatoma of the Fallopian Tube Associated With Tubal Pregnancy. *G. L. Z. Journal of the American Medical Association*, August, 1964

Polypoid chondromatoma is a rare tumor of the Fallopian tube. It is a tumor that is composed of a mixture of spindle-shaped cells, some of which are arranged in a fascicular pattern, and some of which are arranged in a nodular pattern. The tumor is composed of a mixture of spindle-shaped cells, some of which are arranged in a fascicular pattern, and some of which are arranged in a nodular pattern.

The Biochemical Functions of the Endometrium in the Etiology of Metrorrhagia and Menorrhagia. *J. L. Journal of the American Medical Association*, August, 1964

The endometrium is the inner lining of the uterus. It is a tissue that is composed of a mixture of spindle-shaped cells, some of which are arranged in a fascicular pattern, and some of which are arranged in a nodular pattern. The endometrium is a tissue that is composed of a mixture of spindle-shaped cells, some of which are arranged in a fascicular pattern, and some of which are arranged in a nodular pattern.

Obstetrical Paralysis. *J. L. Journal of the American Medical Association*, August, 1964

Obstetrical paralysis is a condition in which the muscles of the lower extremities are paralyzed. It is a condition that is caused by a variety of factors, including trauma, infection, and metabolic disorders. The condition is characterized by weakness and paralysis of the muscles of the lower extremities.

The Clinical Aspects of Renal Infection. *J. L. Journal of the American Medical Association*, August, 1964

Renal infection is a condition in which the kidneys are infected. It is a condition that is caused by a variety of factors, including bacteria, viruses, and fungi. The condition is characterized by pain, fever, and other symptoms.

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In the acute form of renal infection, whether hematogenous or urogenous, one should at first try the conservative measures outlined above. Even a nephrotomy with decapsulation of the kidney and the puncturing of the little abscesses scattered over the cortex may save the kidney. One should not, however, wait too long with such conservative measures, and if a prompt response is not obtained, nephrectomy should be performed at once.

A Treatment for Acute Gonorrhea in the Male.
(Eine Behandlungsmethode des Frischen Trippers der Männer.) PROF. L. MERK, Innsbruck, Medizinische Klinik, July 26, 1914.

The author presents arguments in favor of the use of silver nitrate in preference to the organic silver combinations. He believes that not only the Ag. radical but also the NO₃ has a part in the therapeutic results. He does not believe it proven that the organic silver salts are better because they are not precipitated by albumin. Silver nitrate is also to be preferred because it is less expensive. The Janet method should be used, the patient being given small bottles containing 0.03 to 0.06 silver nitrate and 0.025 potassium permanganate. These the patient dissolves in ¼ liter of very hot water and injects as hot as can be borne (about 37° C.). Most patients can stand three such injections daily.

The Pharyngeal Tonsil in the Adult. L. G. KAEMPFER, New York Medical Record, July 11, 1914.

Kaempfer calls attention to the frequency with which adenoids persist into adult life, and that these cause many of the stubborn chronic conditions within the nose and have a profound effect upon the ears. Until the condition is recognized, many of these patients are treated, sometimes for years, for intranasal and pharyngeal catarrh, obviously with little benefit. Kaempfer reports six cases, the age of the patient ranging between 18 and 32 years. In all six patients, removal of the adenoids caused marked improvement, hypertrophied turbinates became smaller; intranasal congestion was relieved and discharges diminished or ceased. In one case, an old fetid ear discharge was profoundly improved.

[The reviewer can corroborate Kaempfer's statement. It is surprising how frequently routine examination reveals vegetations in the pharyngeal vault, which are frequently the underlying cause of "chronic catarrh" and progressive deafness.]

New Technic for the Removal of Intrinsic Growths of the Larynx. ROBERT CLYDE LYNCH. *The Laryngoscope*, July, 1914.

Lynch uses the suspension laryngoscope for the purpose of viewing the larynx. Many cases are done under local anesthesia. A suction apparatus is necessary. With suitable instruments the author has been able to work with such precision that he can take out a small tumor, reapplying the surface membrane by the application of tincture of benzoin. He has been able to stitch together the membrane of the larynx after excision of the tumor.

The Preparation of Dry Bony Areas for Skin Grafting. CHARLES H. MAYO, Rochester, Minn. *Annals of Surgery*, September, 1914.

Mayo here describes a method, which he has practiced successfully for many years, of shortening the period of healing of large bony surfaces laid bare by burns, infection, or the removal of malignant periosteal growths. He recommends that, by means of a drill, the entire bone area be perforated at intervals of a quarter of an inch apart and predrilling to the diploe of the skull or to the blood supply of the long bone, as the case may be. These perforations cause granulations to come to the surface and unite, with ample blood supply for skin-grafting. Until the protecting granulations appear the wound must receive excellent care to prevent infection. The cases which Mayo thus treated included large areas of the skull left after the excision of carcinoma, sarcoma, or infection with pneumococci.

Correction of Permanent Contractures of the Fingers Secondary to Cellulitis of the Palm. (*De la Correction des Flexions Permanentes des Doigts Consécutives aux Panaris et aux Phlegmons de la Paume de la Main.*) H. MORESTIN, Paris. *Revue de Chirurgie*, July 10, 1914.

These flexion contractures, occurring most often among the working classes, are the most unfortunate of the sequelae of infections of the fingers and the palm. In the severe grades under consideration by the author the attempt is made at their reconstruction. Morestin's treatment consists, essentially, in the division of all obstacles opposing extension and the fixation of the finger in the corrected position. He makes two flaps of skin, one on each side of the longitudinal scar, and then proceeds to carefully and minutely excise all the scar tissue that opposes extension. Incision of the joint capsule may be necessary. Each flap of skin is then split up by angular incisions into tiny flaps that are imbricated to cover the defect. It is essential that joint surfaces are covered in, for the rest, areas of tissues not covered by skin, may be permitted to heal by granulation. The result is, in Morestin's hands, a finger in extension, one in which flexion to a slight degree (action of the interossei and lumbricales) is possible, and apposition to a considerable degree if the finger is the first or fifth. The patients operated upon by him were able to return to their occupations with considerable return of capacity for their work. Morestin scouts any attempt to reconstruct tendons in these cases.

The Effect of the X-Rays Upon Bone Healing. (*Ueber den Einfluss der Röntgenstrahlen auf die Bildung der Knochennarbe.*) K. SALVETTI, Camerino, Italy. *Deutsche Zeitschrift fuer Chirurgie*, Vol. 128, Parts 1 and 11.

These interesting experiments were conducted upon rabbits in an attempt to learn whether the x-rays had any effect upon the healing of fractured bones. From a careful series of histological studies the author shows that Roentgenization of fractures is disadvantageous to the development of callus. Cartilage appears between the ends of the divided bone at too early a time, the bony tissue in the neighborhood of the fracture has less time than in the control animals, and the Haversian systems are too scantily developed. Relatively small doses of x-rays applied daily were sufficient to give these results.

The Treatment of Gas Phlegmons. (*Zur Behandlung der Gasphlegmonen.*) W. GOLDSCHMIDT, Vienna. *Wiener Klinische Wochenschrift*, July 9, 1914.

It is well known that the treatment of gas phlegmon, i. e., wound infection, by the b. aerogenes capsulatus, is usually unsuccessful. Ten successes in eleven cases, observed during the Balkan war, have led Goldschmidt to the belief that his method of treatment will lift this opprobrium. His method consists in wide incision, no dressing except a light application of gauze to absorb discharge and frequent irrigations with peroxide of hydrogen. He believes that close bandaging is contraindicated, because the bacillus is an anaerobic one and therefore grows more readily when air is excluded from the wound.

Coccygodynia—A New Method of Treatment by Injections of Alcohol. F. C. YEOMANS, New York. *Medical Record*, August 22, 1914.

Yeomans reviews the general features of this malady and then submits a report of seven cases in which the injection of alcohol has effected a cure. Briefly, his method is the following: The needle of the syringe is inserted to the point of maximum tenderness over the coccyx; this is usually just below the tip of the bone, in the midline or slightly lateral to it. About 10 to 20 minims of 80 per cent alcohol are then injected. As a rule three to five injections suffice at intervals of five to ten days, and they are to be made at the most tender point. In none of the author's cases has recurrence taken place.

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THE TECHNIC OF SPINAL ANESTHESIA.*

By W. WAYNE BABCOCK, M.D., F.A.C.S.,

Professor of Surgery in the Medical Department of
Temple University; Surgeon to the
Samaritan Hospital,
PHILADELPHIA.

The introduction of a local anesthetic within the dura is followed by a more or less complete arrest of conduction in those spinal nerve roots that come in contact with the solution. If the solution is sufficiently concentrated there is complete arrest of motor, sensory and sympathetic conduction of the segments affected. The effect upon the cord proper is relatively slight and it is often possible under high spinal anesthesia to demonstrate evidences of conduction along the paths of the cord. With weak anesthetic solutions sensory conduction may be arrested with but imperfect loss of motor or sympathetic conduction, while very weak solutions may cause only an imperfect analgesia. As would be expected, the loss of protopathic or pain sense involves a wider area and is more intense than the loss of epicritic or touch sense. Patients may, therefore, feel the knife, although it does not hurt them, or they may complain that alcohol burns the skin, although they do not recognize the incision of tissues. The duration of intradural anesthesia is influenced by the dosage and concentration of the drug employed and varies from twelve minutes to two hours. One to one and one-half hours is the average duration for the adult.

The most effective percentage strengths for intradural use we have found to be 4 per cent. for stovaine, 4 or 5 per cent. for tropacocaine, and 7 or 8 per cent. for novocaine. The weaker solutions give too light and transient an anesthesia and tend to become too widely diffused, while the stronger solutions are so concentrated as to diffuse imperfectly, limiting their area of action and at times increasing their danger. To secure efficiency when using a strong solution, the operator may be tempted to increase the dosage. For example, Jonnesco, who uses a 10 per cent. solution for lower spinal work, advocates nearly twice what we consider a normal dosage. Five or six centigrams of stovaine in 4 per cent. solution will give an analgesia that lasts about ninety minutes; two or three centigrams of stovaine in 4 per cent. solution will produce an analgesia that lasts about fifteen or twenty minutes. It follows that in very young children, for whom only small doses may be given, prolonged operations are not conveniently done under spinal anesthesia.

Spinal anesthesia acts with great rapidity, the analgesia appearing within a few seconds after the injection and being rapidly followed by loss of motor power and muscular sense. With the average adult dose the analgesia reaches its intensity about fifteen minutes after the injection, and then gradually fades. First the motor loss and muscular sense gradually return, the sympathetic regains its tone, the area of epicritic loss becomes gradually reduced, and finally the area of protopathic arrest disappears. The effect is tide-like, the influence gradually spreading upward along the cord until the highest nerve roots in the effective range of diffusion of the drug are affected, and then the wave of analgesia recedes. This tide, which washes upwards and then returns, is not so clearly noticeable in a downward direction, although when a small dose of the analgesic has been injected near the upper part of the cord, there may be observed waves of analgesia passing simultaneously upward and downward, to reach their intensity and widest limits, and then gradually recede toward the segments close to the point of injection. As the analgesic wave diffuses upward the strength of the drug is weakened by the diluting cerebro-spinal fluid. For this reason the nerve roots near the apex of the wave are more lightly and transiently affected than the nerve roots first washed by the injection.

For prolonged and complete analgesia it is desirable, therefore, to make the injection if feasible into the dura through an interspace adjacent to the nerve roots that supply the field of operation. Thus for operations upon the perineum or anus the injection is especially effective if made through the third or fourth lumbar interspace; for operations upon the leg, through the second lumbar interspace; for the lower abdomen or groin, through the first lumbar interspace; while for operations upon the stomach, gall bladder or liver, the injection is most effective when given through the eleventh or twelfth dorsal interspace. With a minimum dose injected through the twelfth dorsal interspace, although the analgesia may be sufficient for upper abdominal work, it may be transient and patchy for operations upon the legs or perineum. It is obvious that the operator who injects the solution through the fourth lumbar interspace and then attempts to do a gastro-enterostomy, will condemn the anesthetic as ineffective and unreliable, as may also the operator who attempts an operation upon the toes after injecting a small quantity of the analgesic in the twelfth dorsal interspace.

The injection of weak solutions in the lower part

*Read during the Second Meeting of the American Association of Anesthetists, at Atlantic City, June 22, 1914.

Solutions extemporized from powders or tablets I have abandoned from fear of bacterial contamination.

SELECTION OF THE PATIENT.

We have employed spinal anesthesia in patients of all ages, from the new born to those of advanced life. It may frequently be employed where ether is inadmissible or has produced dangerous symptoms. Probably no anesthetic gives as great a degree of muscular relaxation with as little danger as spinal anesthesia. As a rule, patients who have a marked hypotension of the circulatory system, or those in whom a marked reduction of vasomotor pressure would be dangerous, should not have spinal anesthesia. Should it be administered to such a person a cannula should be tied in a vein of the arm connected with a funnel of salt solution before the intradural injection, and any dangerous fall of blood pressure counteracted by the cautious intravenous introduction of the salt solution containing adrenalin. By this expedient, I was enabled to successfully carry a patient, at the beginning pulseless and apparently moribund from a ruptured uterus, through a Porro operation. A patient pulseless or nearly pulseless from traumatic shock should not, as a rule, be given spinal anesthesia until reaction has occurred. Patients with advanced peritonitis, with great abdominal distension and cyanotic extremities, are not good subjects for spinal anesthesia; especially is this true of the middle-aged obese patient. Patients in collapse from traumatic ileus do not well withstand the hypotension of spinal anesthesia. Patients with advanced septic disease of the biliary system and associated marked myocardial weakness are also bad subjects. The method is contraindicated in patients greatly depressed and toxic or with mechanical limitation of respiratory space, as from large pleural effusions or pus or serum, or massive intrathoracic growths. In patients in collapse from hemorrhage, the intradural injection should be made with great caution. Obese patients with short, thick chests and limited breathing apparatus are less favorable than patients with large respiratory mechanisms. Those very depressed patients who may be carried through an operation by local anesthesia or a few whiffs of ether should not be given the intradural injection. Patients with large fibroid tumors and myocardial degeneration should be given the injection with great caution. The aged and debilitated should be given relatively small doses. Young or middle aged adults of the robust type, patients with the hypertension of renal disease or eclampsia are good subjects for the injection. Children withstand rel-

atively large doses. Thus $1\frac{1}{2}$ ctgm. of stovain may be given to the new born; 3 ctgm. to a child of five; 4 ctgm. to a child of ten. The proportionate size and robustness of the child are more important than the exact age.

PRELIMINARY NARCOTISM.

The retention of consciousness within the operating room is often objectionable, and in many instances this may be obviated by the preliminary injection of narcotics. We have employed morphine and scopolamine chiefly. For a robust adult $\frac{1}{6}$ of a grain of morphine sulphate with $\frac{1}{100}$ of a grain of scopolamine or hyoscin hydrobromide is given by hypodermatic injection about seventy-five minutes before the time of operation. If in twenty minutes the patient answers questions without evidence of mental confusion the injection is repeated; while for certain very robust and resistant patients a third injection of morphine either alone or combined with a $\frac{1}{15}$ of a grain of apomorphine if the delirifacient action of the scopolamine predominates, or of both morphine and scopolamine if the previous injections have produced little effect, is given. These injections should be given at intervals of about twenty minutes and should be used with great caution or avoided in the debilitated, toxic or aged patient. In patients under thirty the delirifacient action of hyoscin or scopolamine often predominates and is objectionable. In these patients the initial dose of morphine may be $\frac{1}{4}$ grain in combination with $\frac{1}{50}$ of a grain of atropine. In children narcotics are rarely required. After the intradural injection, if properly reassured the child usually quickly adjusts himself to the environment of the operating room, and when convinced that the numbness and loss of power of the legs are quite proper, the little patient often will fall asleep during the operation. Narcotics intensify and by reducing epicritic sense increase the duration of spinal analgesia. When properly used they enable the patient to pass through the operation oblivious of the fact that he has been removed from his bed, and often strongly protesting on awakening that he has not been operated upon or even been asleep.

While narcotics render the patient oblivious of the operation, they increase the danger of spinal anesthesia or of any other anesthetic that may be administered, as they depress the centers of the central nervous system, suppress certain metabolic processes and produce undesirable, although often transient, alterations in the parenchymatous organs. In the asthenic, shocked, debilitated or aged patient they should be used with the greatest care or

avoided. Preceding or during spinal anesthesia consciousness may also be dulled by the administration of ether or other anesthetic by inhalation.

ASSOCIATED LOCAL ANESTHESIA.

Local anesthesia is at times of value in association with spinal anesthesia to extend the incision above the level of the analgesia or to prolong the intradural effect which may partly pass off before the operation has been completed. Likewise, in very extensive amputations, it is desirable to employ Crile's method of nerve blocking in association with the spinal analgesia.

AFTER TREATMENT.

Immediately after the operation patients who have received narcotic injections usually are given a large enema. Two quarts of warm water to which may be added 2 ounces of glucose and 3 drachms of sodium bicarbonate are slowly run into the bowel, and each fourth hour thereafter for the first twenty-four or forty-eight hours the patient receives from 4 to 8 ounces of fluid by rectum. If the narcosis is too prolonged or intense, there is incorporated into the first enema a pint of black coffee and 2 drachms of tincture of capsicum. The deeply narcotized patient must constantly be watched until awake and if there is any evidence of cyanosis or of obstruction in the upper air passages, the tongue and lower jaw must be held forward in such a manner as to give a free air way. In several instances death from suffocation has resulted from failure to observe this rule in patients comatose from scopalamine-morphine.

METHOD OF INJECTION.

Before being brought to the operating room the back of the patient is scrubbed with acetone and painted with a 2 per cent. tincture of iodine. A dry sterile binder is then applied. In the operating room the patient is seated across the operating table so that he sprawls back from the edge of the table. The dressing is then removed and the back either flushed with alcohol or given a second coat of one-half strength tincture of iodine. The assistant observes that the patient sits squarely across the table, that the legs are even, that the elbows are parallel and at the sides of the patient, and that the forearms are crossed in front of the patient's body. Facing the patient he then stands on a low stool, holds the patient's hand with his right hand, while his left arm encircles the back of the patient's neck and his fist makes pressure against the patient's abdomen. The patient's chin is then forced down upon his chest, the back is arched, but the patient should not be permitted to lean forward. The desired spinal interspace is now selected.

POINT OF INJECTION.

The point of injection for an abdominal operation should be approximately on a plane with the operative area. Thus for operations upon the stomach, liver or gall bladder, injections through the twelfth dorsal interspace give the best analgesia. For operations upon the lower half of the abdominal cavity, the first lumbar interspace; for operations upon the leg, the second or third lumbar interspace; for operations upon the perineum, the fourth lumbar interspace may be selected. Practically most of our operations have been done by injections through the first or second lumbar interspace with an occasional twelfth dorsal injection when it was desired to thoroughly anesthetize the upper abdomen. As a rule, the lower point of injection is safer, as the involvement of the upper dorsal nerve roots interferes with the respiration and increases the fall of blood pressure.

APPARATUS.

A syringe of 2 c.c. capacity of the Luer type is preferred. If properly made, the piston of such a syringe fits loosely enough to be forced out by the pressure of the intradural fluid. This is important as showing that the needle has properly entered the arachnoid. The Record syringe is rather heavy, and the piston does not move with sufficient ease. To insure delicacy of manipulation the needle should likewise be small and light. It should be of iridized platinum or gold to avoid breakage, have a length of about 7 centimeters and a diameter of 1-10 centimeter. A well fitted stylet should be provided so that the needle cannot become clogged in the introduction. The syringe, needle and stylet should be wrapped in gauze and boiled just before using, in water free from alkali, for fifteen minutes. The apparatus should be brought to the operator while still boiling hot not only to insure sterility, but also to serve to warm the anesthetic solution. The assistant now wipes the surface of an ampule with a lot of gauze moistened with alcohol and breaks the ampule at its neck. The contents of the ampule are drawn into the syringe and air bubbles and excess of solution expelled. For an adult, the syringe usually should now contain from 1.2 to 1.5 c.c. of the solution. The needle containing the solution should be centered close to the midline at right angles to the bed and about the middle of the interspace. It should be carried directly forward until it is felt to be impacted by the dense posterior ligament. Only in the dorsal region it is necessary to tilt the needle somewhat upward. In the lumbar region the greatest success is obtained by entering the needle at right angle

to the surface of the body. Following this rule I have failed to enter the spinal cavity only once in over 4,000 personal cases, the failure being in the case of a kyphotic dwarf. If the patient shows a scoliosis do not enter the needle in the midline of the body, but along the midline of the spinous processes, and pass the needle directly forward instead of attempting to deviate it to the midline of the back. The grasp of the needle by the cartilaginous interspinous ligament usually indicates that the needle is passing in the proper direction. After penetrating the ligament the stylet is withdrawn and the needle pushed forward a few millimeters at a time. The hand notes the cessation of resistance as the needle passes through the interspinous ligament and enters the loose areolar space external to the dura, and finally the slight resistance succeeded by a snap, as if a drum head had been punctured, when the needle penetrates the dura. If the needle being rather dull does not immediately puncture the dura, it is given a partial rotation so that its edge may cut through the dura. As soon as the dura is entered, cerebro-spinal fluid should begin to drop from the needle. If it does not do so, the needle is cautiously rotated and slightly moved until there is a free flow of fluid. At times it is necessary to reintroduce the stylet, make a very cautious aspiration with the syringe or to seek another interspace. If there is much difficulty with the first attempt, it is usually best to try another interspace. At times, if the needle enters directly in the median line, the plexus of veins external to the dura will be punctured and a few drops of blood may flow from the needle. We have observed no evidence of harm from this injury, and the flow of blood is usually quickly succeeded by clear cerebro-spinal fluid. With the cerebro-spinal fluid running freely, and *only when it is running freely*, the charged syringe is affixed to the needle. The piston is first withdrawn a short distance to permit the cerebro-spinal fluid to enter and mix with the solution, as well as to again prove the proper introduction of the needle. If a thorough diffusion is desired a part of the solution is now injected, more cerebro-spinal fluid is withdrawn by the syringe, and this procedure repeated two or three times until the syringe is empty. The needle is now quickly withdrawn, and if a light solution has been used, the patient immediately laid upon the table, which is so tilted that the shoulders are 2 inches below the level of the hips. This is to prevent an undesirable upward diffusion of the drug. Not over twenty seconds should be consumed in the injection.

The pulse and respiration are now continuously

watched, the latter by the movements of a wisp of cotton affixed to the end of the nose. If the patient is awake, diverting conversation is often desirable, and if not contraindicated by the operation small bits of ice or sips of water may be administered. If the patient is very weak an injection of 4 grains of caffeine and 1 $\frac{15}{16}$ of a grain of strychnine sulphate is given subcutaneously to anticipate any respiratory depression. A nearly pulseless patient should also have a needle, connected with a funnel containing physiologic salt solution, tied into a convenient vein. The salt solution is permitted to run into the vein from time to time as may seem to be indicated, and to each 6-ounce funnelful is added from 1 to 10 drops of adrenalin. The adrenalin must be used with caution and we do not add it unless the patient becomes pulseless at the wrist. The flow of adrenalin is also to be cut off by pinching the tube as soon as the pulse returns, for fear of an excessive action upon the heart. For weak patients, not sufficiently asthenic to require the intravenous use of adrenalized salt solution, the subcutaneous injection of one ampule of pituitrin at the onset of the operation may be of value. For nervous faintness, the inhalation of aromatic spirits of ammonia or a few drops of ether may be tried.

Should the patient show evidence of nausea, the head and shoulders are lowered to a greater degree by inclining the table. Should respirations become shallow or imperfect then artificial respiration by compression of the thorax must be resorted to. It should be continued if necessary for one hour or more, or until the patient is able to resume spontaneous respiration. If the patient be so obese or the intrathoracic condition so interferes as to prevent artificial respiration by compression of the thorax, then forced artificial respiration should be tried. In such an emergency we doubt the value of the Meltzer intra-tracheal method. The pulmotor, if quickly available, may be used. In a sudden emergency we can certify to the value of a full size tracheal tube and the direct rhythmic inflation of the lungs by the surgeon or assistant. Using a piece of drainage tube that is cut off square at the end, pressed over the opening of the tracheal tube, the surgeon inhales deeply and inflates the patient's chest by blowing through the rubber tube. Exhalation occurs when the tube is lifted from the external plate of the tracheal tube. The pressure of the inflation cannot be harmful for an adult, as it cannot exceed or indeed reach the pressure within the surgeon's chest. While this method involves

the disease. No mechanical injury has occurred, yet the picture is that of shock.

We should, then, be careful to tell the circumstances under which shock has arisen. To speak of a particular case as traumatic shock is not sufficiently definite, unless we specify whether or not the central nervous system has been injured directly. If the central nervous system has been injured, we may have the exact homologue of the laboratory condition known as spinal shock. Not all injuries to the central nervous system result in a complete blocking of all the paths below a certain region, so that the description is not sufficiently exact unless the nature and extent of the injury is specified. The man with a crushed leg may die from shock, and the teamster who has had his spinal cord crushed beneath a load of coal may recover, although certain of the manifestations of shock may be more severe in the teamster with the crushed spinal cord.

To the laboratory worker, certain clinical descriptive terms, such as traumatic shock, do not, therefore, convey any very definite idea either of the nature of the injury or of the condition of the patient. I shall not, therefore, attempt, in this paper, to follow the ordinary clinical terminology, and I trust you will pardon me if I speak of conditions rather than names.

Since in practically all cases of acute shock, low blood pressure is one of the physical signs, we may first look into the mechanism for maintaining blood pressure under normal conditions, using this as a type of reflex nervous mechanisms, and then point out some departures from the normal as they occur in shock.

The heart and blood vessels, both of which are under the control of the nervous system, are the principal agents in maintaining blood pressure under ordinary conditions. The vasomotor nerves vary the caliber of the arteries and arterioles, and the mean blood pressures tends to rise or to fall according to whether the vessels constrict or dilate. When the blood pressure tends to fall because of the dilation of the blood vessels, the heart beats faster, because of accelerator impulses sent out from the central system over the sympathetic nerve supply, and forces more blood through the vessels. When the vessels are constricted, the heart beats more slowly, in response to impulses passing out of it over the vagus. The rapid heart rate of a man who has just finished running is familiar to all of you. But the heart will not beat faster when the blood pressure falls, nor become slower when the blood pressure rises unless the sympathetic and

the vagus nerves are uninjured and active. When these nerves are rendered inactive by cutting them across, the rate of the heart is unchanged when the blood pressure rises or falls.⁴ Rabbits can no longer run distances after these cardiac nerves are cut, although there may be no lesion of the heart or of the blood vessels. The thing to remember is that the heart while in the animal body under constant physico-chemical conditions will not change its rate unless acted upon by nerve impulses coming from outside the heart. I insist upon this point at this time because of a slight misconception that may have arisen in the past.⁵ Only after its excision from the body will changes in pressure alone bring about changes in the heart rate, and the rate then increases with the pressure.

It is my belief that there are at least four mechanisms involved in the maintenance of blood pressure, namely, (1) the vasomotor nerves, whose common point or origin lies in the medulla oblongata; (2) the heart and its nerves—intrinsic, perhaps, as well as extrinsic; (3) the skeletal muscles; and (4) some property of the tissues of the vessel walls, possibly independent of the nervous system, in addition to those properties directly under nervous control.

These mechanisms for maintaining blood pressure are, however, dependent for the most part upon the central nervous system for their efficient and coördinated action. And, as Descartes long ago suggested with reference to coördination in general, the central nervous system here serves as the mechanism of coördination between the afferent impulses and the motor response. We must consider, then, the various structural or functional elements interposed between the starting point of the afferent impulses and the muscle or gland cell in which the response occurs.

At the outset of the discussion of the nervous mechanisms involved in the process of coördination, we may point out that there are two systems concerned: (1) the somatic system, sensory and motor, and (2) the visceral system, sensory and motor.

The somatic sensory nerves arise in the organs of general and special sensation, the eye, the ear, the skin, muscles, tendons, and joints. They convey information of the general happenings in the somatic or "body" part of the organism. Most of these impulses at some time or another arise into consciousness, although some of them undoubtedly pass directly through the lower levels of the nervous system without entering into the cerebrum.⁶

The somatic motor system is concerned with the movements of the skeletal or striated muscle.

The visceral motor nerves arise in glandular structures and in smooth muscles throughout the visceral system. Some of them convey impulses which may enter into conscious process, but others do not. They constitute the efferent portion of the sympathetic or autonomic system.

By the autonomic system, Langley means not only all the sympathetic system but also certain fibres in some of the cranial nerves, such as the vagus, and spinal fibres in the nerve roots. It includes both afferent and efferent fibres.

The visceral motor nerves, as their name implies, convey afferent impulses from the central nervous system to the various structures comprised in the viscera—the heart and the blood vessels, the gastrointestinal tract, all the glands and other similar structures containing smooth muscle fibres. They belong to the efferent portion of the autonomic or sympathetic nervous system.

In the operation of any mechanism which involves the coordination of afferent and efferent impulses, there is first of all a receptor or nerve ending at the periphery which is sensitive to stimuli. This receptor may be a free ending of the nerve in the tissue or it may be a specialized ending which is particularly sensitive to one particular form of stimulus, such as light, or touch. Sherrington has defined a sense organ as a mechanism for lowering the threshold value of the stimulus. As a rule, the nerve endings are more sensitive to stimuli than the nerve trunks. There are (a) afferent nerves leading from the receptor to the central system; (b) the junction or synapse—perhaps many synapses in series, in the central nervous system itself between the terminations of the afferent neurone and the final efferent neurone; (c) the efferent fiber; (d) the terminations or end plates of the efferent fiber; and (e) the effectors—muscles, gland cells, or whatever else they may be. All of these things enter into the formation of a reflex arc in a higher animal. And as each of them has certain peculiar properties of its own, as evidenced by its reactions to drugs, or to other changes of conditions, we may consider each one separately.

The receptors and the afferent nerves may be anesthetized either partially or wholly, by cold, pressure, cocaine, and similar agents, or some of them may be more unusually sensitive through inflammatory processes.

The synapses are affected by strychnine and other drugs, and by changes in the oxygen and carbon-dioxide content of the blood. The synapses also have the faculty of summation in a high degree (Surling). A single stimulus applied to an afferent

nerve may produce a contraction of the effector indirectly, instead of directly, if the stimulus is strong enough to pass the synapse, or if it is sufficiently intense to pass the synapse and excite another one. The synapses are the points of summation of the impulses to the effects of peripheral organs, as is shown by resuscitation after death.

Strychnine, by its action on the synapses, the transmission of impulses, increases the resistance of the synapse. But even in small doses it may increase the resistance or even block conduction in a motor impulse. This probably explains why convulsions may occur at a time when the possibility of the synapses for reflexes of the skeletal muscles is but little increased, and the paralysis of a previously injured region of the spinal cord, e.g., during or after recovery from anæmia, for responses of the skeletal muscles as well as vasomotors, ceases at a time when the reflex resistance of the skeletal muscles through uninjured portions of the cord is still increased. The paralysis of strychnine is manifested earlier after previous lack of oxygen than otherwise.

The efferent nerve cells are excited by an increased concentration of carbon dioxide in the blood and asphyxial conditions may result. The cells constituting the respiratory center in the medulla oblongata are particularly sensitive to slight changes of oxygen and carbon dioxide tension in the blood. It is the changes in the concentration of the hydrogen ions associated with these slight increases in carbon dioxide or decrease in oxygen which constitute the effluent stimulus for respiratory movements.

The relation of the efferent nerves to the effectors, i.e., the muscle or gland cells, is not altogether a simple one. There is good reason for believing that there is a third element intervening between nerve fiber and the muscle or gland cell—the receptor substance of Langley. The three elements—the end of the nerve fiber, the receptor substance, and the muscle or gland cell—constitute what Elliott has called the myoneural junction, and, according to Elliott, it is upon this myoneural junction between sympathetic nerve fibers and smooth muscle that adrenalin acts. Adrenalin does not act upon smooth muscle directly, or upon the muscle which is not innervated from the sympathetic system does not respond to its application. But smooth muscle which is innervated by the sympathetic system will respond to the application of adrenalin even after the nerve ending has been divided and has degenerated.

The myoneural junction between somatic nerve

and striated muscle is markedly affected by such drugs as curare, by certain toxins whose origin apparently is in the gastro-intestinal tract, by the waste products of metabolism, fatigue products, and other substances of like nature.

The synapses, particularly of certain regions of the central system, and the myo-neural junctions are the weak places in the reflex arc, and the places most commonly acted upon by foreign substances, toxins, or other adverse influences. The nerve fibers are, in general, more resistant than the nerve cells.¹² The Betz cells of the cerebral motor cortex may be inexcitable during ether narcosis, but the fibers of the pyramidal tract in the spinal cord may still be highly excitable. Nor are the synapses between the fibers of the pyramidal tract and the cells in the spinal cord about which they end affected to the same extent as the synapses in other regions, such as the cerebrum.

Afferent impulses over the visceral sensory nerves are not limited in their effects to reflex responses through the visceral motor system. Irritation within the stomach may lead to vomiting, and as will be shown a little later, vomiting involves the action of certain striated muscles. Similarly, afferent impulses over the somatic sensory nerves may bring about a reflex response which will involve the visceral motor system as well as the somatic. The mere sight of a disagreeable object may produce vomiting.

This community of relationship between somatic sensory, somatic motor, visceral sensory, and visceral motor systems is an important one. Various kinds of afferent impulses may lead to the same general motor response. The various kinds of afferent impulses which may lead to vomiting illustrate this point. But no matter over what channels the different afferent impulses which lead to a particular motor reaction may pass, they eventually come to a definite group of cells somewhere in the central system, in which the motor or efferent impulses arise. From this point on, the path is the same, no matter what the nature of the afferent impulse may be. We have, therefore, the principle of the final common path (Sherrington) founded on facts of the general character which are here briefly indicated.

In addition to the reflex elements involved in the maintenance of blood pressure, there is evidence of the existence of an automatic elements, i.e., an element dependent upon the changes of blood pressure or blood constituents within the vasomotor center in the medulla oblongata.¹³ This is analogous, though not so preponderant in its action, to

the well-known automatic element in the respiratory mechanism, dependent upon the "blood-stimulus" for its normal operation. Evidence of such a sensitiveness to the "blood-stimulus" in the motor cells of the spinal cord has been recently adduced by Graham Brown.¹⁴

Such, then, is the nervous, muscular, and glandular mechanism involved in the circulation, and such are its strong and its weak points. Which of these are affected in shock, and how?

It requires but little reflection to see that the sympathetic—the viscerosensory and visceromotor system is the one primarily and most markedly affected in surgical shock. The patient may be fully conscious, and have voluntary control of the movements of the skeletal muscles. It is true that the movements may be sluggish, and that the skeletal muscles may be more flaccid than usual, but it is a question whether this may not be a secondary result of the low blood pressure and other disturbed metabolic conditions of the body as a whole, rather than a primary effect.

Nor would complete relaxation of the skeletal muscles, such as occurs after intravenous injection of curare, account for the great fall of blood pressure observed. The vascular system and the heart must then be responsible. It is commonly observed that the heart beats rapidly in such conditions. The heart itself, independently of its extrinsic nerves, never beats more rapidly when the blood pressure is low. The heart must, therefore, be receiving accelerator impulses over the sympathetic nerves during certain phases of shock.

The reflex mechanism for acceleration of the heart is not exhausted nor depressed, but, on the contrary, is more active than usual.

It has been shown also that many of the peripheral arteries are constricted and not dilated.¹⁵ So far as these vessels go, there is again no exhaustion of the reflex or other mechanism for vaso-constriction, but even an increased activity. The question arises whether all the arteries in the body are similarly constricted, or whether some of them may be widely dilated. It is known, for example, that the peripheral blood vessels, and particularly the arterioles, constrict when the surface of the body is cooled, but the systemic blood pressure does not necessarily arise. Nor does the increased flow of blood to the surface when the external temperature is high necessarily entail a fall of pressure. There is either a compensatory change in the caliber of the deep blood vessels or a change in the heart rate, or both, by which the blood pressure is maintained at a nearly constant level. Porter,¹⁶ how-

auditory cortical areas of the other hemisphere of the cerebrum.

Similar considerations apply to the cerebellum. There is inexcitability of the cortex, and a complete absence of all the usual reflex phenomena attributable to the cerebellum, such as tone of the extensor muscles of the limbs. Yet, chromatolysis occurs here also.

It is one of the well-established facts of neurology that afferent fibers from a given region of the body terminate in definite regions of the cerebral cortex. And it is likewise a fact that the cells of origin of the motor fibers to the muscles of any given region of the body lie in a definite area of the cerebral cortex. There is a definite localization of the projection fibers, afferent and efferent, in the cerebrum. We should accordingly expect to find chromatolysis in those regions of the cerebral cortex in which the afferent fibers from the injured part end, or in which the cells of origin of the motor nerves to its muscles and glands lie. Such, however, is not the case. Dr. Crile admits that there is no specificity of chromatolysis, but that it occurs in all regions of the cerebrum and in the cerebellum.

It has been shown also that chromatolysis occurs in animals which are not in the condition of surgical shock, but which manifest rather different physical signs.²⁰

Finally, Nissl himself pointed out some years ago that chromatolysis was not a lesion indicative of any specific injurious influence, but that it might arise in response to many injurious agencies.

To sum up the situation with reference to the rôle of the cerebrum in, and the relation of chromatolysis to, the cause of shock, the various lines of evidence adduced: (1) that, when an animal is in a condition of surgical anesthesia, no afferent impulses which are normally operative are producing any noticeable reflex response on the skeletal muscles; (2) that, in general the cortical cells are inexcitable to electrical stimuli at such a period; (3) the fact that chromatolysis occurs not only in the particular regions of the brain in which they might be expected to occur on any known basis of localization, but also in other widely removed and scattered regions of the brain; (4) that animals may show a considerable degree of chromatolysis and not manifest any of the physical signs of surgical shock as they are ordinarily understood; and (5) that chromatolysis may occur in response to the action of many diverse injurious agents, such as the anesthetic itself, force one to conclude that the relation of chromatolysis to the onset of shock cannot be very important or very definite.

An animal may be completely decerebrated without showing any particular signs of surgical shock, although the spinal shock may be profound. After a time the reflexes of the skeletal muscles return and the symptoms of spinal shock gradually abate in severity. But it is now possible so to treat the animal as to induce the condition known as surgical shock. The blood pressure falls, the pulse becomes rapid and feeble, and the respiration shallow, or even periodic. Surgical shock may be induced in the absence of the cerebrum, and whatever afferent impulses may be involved in its onset certainly do not pass through the cerebrum. Nor are efferent impulses from the cerebrum demonstrable here.

These facts acquire a peculiar significance with reference to the onset of shock when considered in the light of the relation of the medulla oblongata to the visceral system. It is in the medulla oblongata that we find the first extensive connection between the nerves bearing afferent impulses which are capable of affecting the viscera and the efferent visceromotor fibers.²¹

In addition to the rapid heart rate and the constriction of the arteries already mentioned, there are certain other effects due to the sympathetic or autonomic system that are worthy of some attention. Space does not permit their consideration at this time. Nor can the discussion of the sources of the afferent impulses be taken up in detail. Both of these questions must be left for future discussion.

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tion. I found that she had been vomiting persistently. The vomitus was scanty and of a distinct coffee ground character. Her restlessness was intense, constantly tossing about the bed, and her lips and sides of her mouth were excoriated from the constant passage of gastric contents. Her pulse was rapid and feeble and she had the expression of a patient suffering from a profound shock, and looked as if she was rapidly going sous ground. A pronounced fruity odor to her breath and the presence of acetone in her urine led us to believe that she was a case of post-operative acid intoxication, and the prompt application of the proper remedies saved her life, though her convalescence, due to the profound exhaustion, was a protracted one.

It takes an experience of this kind to awaken one, and I immediately began to search the literature for information. I was rewarded by finding many excellent contributions upon the development of acid intoxication following anesthesia, upon the relationship of this condition to post-anesthetic vomiting and upon its therapy and prophylaxis. Caspar, Langenbeck, Guthrie, Bevan and Faville report cases following the use of chloroform under the caption of the so-called delayed chloroform poisoning. Becker, Rhamy, Brewer, Fren, Waugh, Brockett, Stone and Low give their experience after ether, while Chalfant reports from a study of 700 cases the relations between post-operative vomiting and acetonuria. I can find no reference to the development of this condition after nitrous oxide, but it so happens that the worst cases we have had in Baltimore, and in fact two fatal cases that I have been told about, followed short anesthetics under gas and oxygen. The therapeutic and prophylactic sides of the question have been thoroughly treated by Marchand, Bresley, Biddart, Wallace and Gillespie, so you see I am indeed simply calling your attention to an old subject.

The clinical pictures presented by these cases resemble more or less the case previously described, the symptoms varying with the intensity of the intoxication, and the fatal cases terminating in coma. It is hardly within the scope of this paper to go into the theories regarding the physiology of acid intoxication, or the part the anesthetic plays in its etiology other than to say that acetone forms in the system as the result of abnormal fat metabolism, that the complete combustion of fats requires the simultaneous katabolism of carbohydrates, in the absence of which there is a defective and abnormal course of fat metabolism, resulting in the formation of various fatty acids and acetone. This carbohydrate deficiency, barring outside influences such

as starvation or restricted diet, results from some disturbance in the glycogen-storing functions of the liver. What part does the anesthetic play in this glycogenolysis? It must be either due to some direct destructive action on the part of the anesthetic upon the liver cells, or else, as MacLeod suggests, to some action upon the splanchnic nerves controlling the glycogen output.

At all events, from a practical standpoint, we are dealing with bad conditions, a toxemia of an acid character and a carbohydrate deficiency. Common sense would seem to suggest the employment of an alkali and a sugar. Bresley in a series of articles describes his results in the treatment of acid intoxication both from a therapeutic and prophylactic standpoint, with bicarbonate of soda. Those treated after symptoms developed rapidly improved, and those treated before operation recovered without any vomiting. He lays great stress upon pushing the soda until the urine is alkaline, reporting cases with absolutely no vomiting, and I wish also to emphasize this point. Later Biddart also reports his results with the use of glucose as a prophylactic, giving half an ounce every four hours for six doses. Wallace and Gillespie draw their conclusions from a study of three series of cases, treated (a) with soda, one-half drachm every four hours until half an ounce has been taken; (b) with glucose, half an ounce every four hours for six doses; and (c) with no treatment. They believe that the carbohydrate treatment is more effective as a prophylactic to control vomiting than the alkali, but that the alkali is more efficacious after symptoms have developed. In the control series where neither was used there was distinctly more vomiting than in either of the other two groups of cases.

I could see no reason why both an alkali and a carbohydrate should not be given both before and after anesthesia. Accordingly I began giving patients one drachm of soda bicarbonate and one drachm of lactose every four hours for at least forty-eight hours before operation. I purposely gave a small dose of carbohydrate in accordance with Taylor's theory that a small amount of carbohydrate is sufficient to check an acidosis. If upon admission to the hospital the urine was acid, the dose of soda was increased so as to have the urine alkaline at the time of operation. Immediately upon returning to the room the patient is given a 5 per cent. solution of sugar per rectum by the Murphy drop method, using usually about 250 c.c. or 300 c.c. at a time. Sips of a 2 per cent. soda solution are given repeatedly for the first day and upon the second and third days 30 grains are

process, nor the evidence that the liver and the adrenals are directly controlled by the brain, which also controls the transformation of energy, which in turn, as we have already stated, always produces acidity; we will merely recapitulate by saying that the harder the body is driven by any stimulus, the more rapidly will latent energy be transformed into kinetic energy. The more rapid the transformation of energy, the greater the production of acid. The greater the production of acid, the greater also the strain upon the power of neutralization possessed by the liver and the adrenals, and the greater the drain upon the body's store of alkalies and bases. When the liver and the adrenals are overtaxed, and the alkalies and bases are exhausted, the state of acidosis is reached.

Clinically it has long been recognized that when a patient is in a state of exhaustion resulting from infection, from injury, from shock, from starvation, from hemorrhage, or from any other cause whatsoever, he may never recover consciousness after the administration of a general anesthetic. In a Hungarian reference, the title of which I do not recollect at the moment, it is shown that starved dogs inevitably die after inhalation anesthesia. Clinicians know well how unsafe it is to give a general anesthetic of any kind to a patient on the verge of acidosis. A patient with chronic vomiting, with or without chronic pyloric obstruction, with an acetone odor of the breath, with peculiarly pink lips and dry tongue and mouth will in all probability never regain consciousness after being anesthetized. The aged not infrequently die after even a short anesthesia.

Why do not these patients recover? If the patient has the power of consciousness before the anesthetic is administered what happened during the anesthesia to make it impossible for the patient to regain consciousness?

We have already referred to the acid-producing power of stimuli. Shall we conclude therefore that the trauma of the operation alone may have pushed beyond the margin of safety the neutralizing powers of the body already taxed by pre-existing conditions; or is the anesthetic itself a factor in producing the fatal result?

To answer this question, Dr. Menten in my laboratory made for me observations of the H-ion concentration of the blood under various conditions—the H-ion concentration being an index of the acidity of the blood.

H-ion concentration tests were made after the application of many kinds of stimuli, the results of which confirmed the postulate which we have al-

ready stated, that acidity is the result of the activation of the body by any adequate stimulus. The blood was then tested to determine the H-ion concentration in either anesthesia, in nitrous oxid anesthesia, and after the administration of alcohol and of morphin. Both ether and nitrous oxid produced a marked increase in the H-ion concentration, that is, both produced acidity in the blood. After coming out from the anesthetic this acidity was neutralized by the animal in about thirty minutes. This result gave us our clue to the tendency to acidosis and to death after anesthesia of weak and emaciated patients. The increased acidity produced by the anesthesia was sufficient to overcome the already narrow margin of safety. That acid intoxication *follows* the administration of ether and chloroform has been noted by many observers, the acidity being evidenced by the early appearance in the urine of acetone and later diacetic acid. It has also been noted, as one writer states, that the "starvation preceding and following the operation is also a factor of considerable importance."

Our experiments have shown, however, that the increased acidity actually develops *during the anesthesia* itself, sometimes to a fatal degree, and that a starved condition is not only of "considerable" but of *prime* importance, since it means that the acid-neutralizing power of the liver has been purely impaired, if not possibly lost.

Two more important clues were obtained from the result of the H-ion concentration tests after the administration of morphin and of alcohol. Alcohol caused acidity, the acidity not being so marked, however, as that produced by the anesthetics. The H-ion concentration was not altered by morphin, no matter what the size of the dose. When the administration of morphin preceded the induction of anesthesia then a smaller amount of the anesthetic was required to produce complete anesthesia, and the H-ion concentration test showed that the acidity was markedly less than in anesthetized animals which had not received the preliminary dose. The preliminary dose of morphia not only lessened the degree of acidity produced by the anesthetic, but it in no way interfered with the return of the blood to its normal alkalinity; on the contrary, and the following observation is of great significance, if morphin was given *after* acidity had been produced by the anesthetic, it postponed the time of neutralization, and if given in large doses *prevented* the animal from overcoming the acidosis. That is, it would appear that morphin controls the mechanism which governs the neutralization of alkalization of the blood.

These facts, however, are a good basis for the conclusion that the general use of the inhalant method in the treatment of patients with mild conditions in which anasthesis is threatened. Since it is to be the province of diseased conditions, and, indeed, producing a mild anasthesis, needlessly long anesthetics should be avoided, as the increased anidria produced by the anasthesis will diminish the patient's margin of safety. The degree of anidria seems to be proportional not only to the length but to the depth of the anasthesis. There are the highest possible anesthetic depths to be maintained. With static anasthesia, with patients whose vitality is at a low ebb, anasthesis is already markedly present, so that inhalation anasthesis may be absolutely contraindicated. In an operation is mandatory, it is a better method to do local anasthesis, or in the emergency of twilight anasthesis produced by the general administration of nitrous oxide oxygen.

In cases of acidosis, certainly, nitrous oxide oxygen anasthesis is always the anasthetic of choice, for though our tests have shown that like ether it does produce acid in the blood, unlike ether it is not a lipid solvent, does not impair the immunity of the body, and to some extent conserves the energy in the brain cells from exhaustion.

Although, as I have shown elsewhere, both the preoperative and the postoperative use of morphine is of great value in certain cases, in those cases of existing or threatened acidosis its use is contraindicated in a patient interwoven with or prevents the neutralization of acid in the blood, but has, indeed, per se, the effect of helping to diminish the preoperative acid formation, so that the administration of sodium bicarbonate and glucose is of value also.

To re-appraise the value of the various methods of patient anesthesia, we are dealing with a field capped by a rather serious, and, indeed, important or is threatened.

1. The intravenous administration of sodium bicarbonate and glucose, and the use of morphine.

2. Either twilight anasthesis, or the use of general anasthesis.

3. A technique of treatment, consisting, in general, of the use of local anasthesis, and, perhaps, manipulation, which is usually associated with anasthesis, if needed.

4. As rapid a treatment as possible, and, if possible, work that the period of anasthesis is as brief as possible.

ANESTHESIA IN THE ORAL SURGEON

W. G. GALT

The modern practice of anesthesia in the oral surgeon is a different one from that of the past, and the results are such as to be of great value to the patient and to the operator. The use of the inhalant anidria is due to the fact that the patient is not subjected to the upper respiratory tract, which is increased by the local action of the anasthetic. The evil and sometimes fatal results are due to over dosage and uneven dosage, chilling of the lungs by cold inspired air, aspiration into the lungs of foreign material, and fatigue from the undue load placed upon the respiratory system.

Each of these reasons inhalation anasthesis has fallen somewhat into disfavor, and local, spinal, intravenous, and colored anasthesia have been tried in its stead. It cannot be denied that in many cases these alternative methods are expedient, but the necessity for their use has been greatly lessened by the introduction of an improved method of administering anasthetics by the respiratory route, inhalation anasthesis.

By "inhalation anasthesis" I mean the condition which is produced by blowing into the patient's pharynx or trachea a quantity of air or gas sufficient to supply all his respiratory needs without effort upon his part, containing an evenly distributed and consequently non-irritating, minimum dose of the anesthetic agent.

It is now thirty years since I began the use of this method, and to do more than even I am convinced that, for the majority of cases, intratracheal administration of the anesthetic and pharyngeal anesthesia is the most satisfactory method of administering anasthetics through the respiratory tract.

Method

1. *Preparation of the patient.*—Inhalation and the method presented in the operation of the respiratory tract, the patient must be in a condition of relaxation, the extreme nervousness must be largely in the patient's mind.

2. *Position of the patient.*—That position in which the patient is most comfortable, and in which he is delivered to the operator, can be secured, and can be compared with an evenly distributed and measured quantity of the anesthetic gas. The local anesthetic is used in the usual manner, and the patient is placed in a position in which the anesthetic gas can be inhaled, and the patient is placed in a position in which the anesthetic gas can be inhaled.

3. *Administration of the anesthetic.*—The anesthetic gas is administered by the respiratory tract, and the patient is placed in a position in which the anesthetic gas can be inhaled.

mixed with the inspired air, are thus abolished. Dosimetric instruments which do not employ insufflation are very inaccurate because (1) they depend upon extremely variable factors, the respiratory rate and value of the patient, which are affected in turn by the anesthetic, and a vicious circle is often produced; and (2) they do not supply all the air required by the patient, and the efferent mixture is, therefore, diluted with varying quantities of air drawn in directly from the room.

Using the insufflation method, Connell, of New York, has devised an instrument—"The Anesthetometer"—which is absolutely accurate in dosimetry. This apparatus allows us to measure and record our dosage, and compare and standardize our results, so that we can place our empirical knowledge upon a scientific basis, and employ it not only to our own future advantage, but also as a basis of knowledge for those who would otherwise have to learn as we learned—by rule of thumb and personal experience.

The third advantage is that the anesthetic mixture can be warmed and moistened accurately. In this connection I have found in practice a grave fault in the warming apparatus of our instruments: the air and ether mixture, in passing over the hot water, picks up steam, some of which is condensed in the efferent tube. Surely, when this condition is present, there must be too much moisture in the mixture.

I had hoped to describe in detail in this paper a dry heater with separate moistener which is at present being made for the Royal Victoria Hospital, but it is not finished. However, the idea is this: The heater consists of a coil of copper tubing around which a wire resistance is wound. The heat of this apparatus is controlled by a rheostat, and the temperature of the anesthetic mixture which passes through the copper tubing is read from a thermometer placed at the beginning of the efferent tube from the instrument. The air is moistened after leaving the heater, so that too much moisture cannot inadvertently find its way into the anesthetic mixture.

The fourth advantage is that the danger of aspiration is overcome absolutely in intratracheal insufflation. In pharyngeal insufflation it is practically overcome; for, owing to the fact that the anesthetic is delivered behind the tongue and fauces, and that it is evenly distributed and diluted, it does not produce the hypersecretion found in inhalation anesthesia.

The fifth advantage is the improvement in the type of anesthesia produced; quiet breathing, ex-

cellent color, normal pulse and blood pressure, absence of venous engorgement, perfect relaxation, and quick, uneventful recovery.

The sixth advantage is that, in case of necessity, an ideal means of artificial respiration is already at hand. This is especially useful in intrathoracic surgery.

The seventh advantage is the ease of administration. The anesthetist needs to give only a small amount of his attention to the instrument, and consequently can take much more accurate care of his patient. Besides, he is not fighting for room and endangering the asepis of the operative field.

TECHNIC.

In discussing the question of technic, two parts of the apparatus must be considered: (1) the instrument proper, and (2) the efferent tube system.

The instrument proper should give a respirable stream of air or gas, warmed and moistened, with which the anesthetic is evenly mixed. The operator should be able to control and register the volume of air or gas, the amount of the anesthetic, the temperature, and the moisture. A manometer and safety valve should be inserted into the efferent tubing to prevent any undue pressure reaching the patient's lungs, all of which requirements are fulfilled in the Connell anesthetometer.

The tubing system for carrying the anesthetic mixture from the instrument to the patient should, for intratracheal anesthesia, terminate in a catheter, which is inserted into the trachea down to a point three-quarters of an inch above the bifurcation. This catheter should have a terminal opening, and at least two lateral openings near the tip: it should be made of material which will stand repeated boiling; and its caliber should be relatively small compared with that of the trachea. It should be introduced under direct illumination, after the patient has been well anesthetized.

For pharyngeal anesthesia the tubing system should end in a Y-tube carrying two catheters, which are passed through the nose deep into the pharynx. For this method deep initial anesthesia is not necessary.

In actual practice in hospital I have used, for both kinds of insufflation, the Janeway Insufflation Apparatus. This instrument is not dosimetric. For intratracheal insufflation I use on an average 20 mm. pressure; and for intrapharyngeal insufflation, 30 mm. For introducing the intratracheal tube the Chevalier Jackson Pharyngoscope has always answered perfectly.

I have special tubes made for this work, which are almost rigid when cold, but soften up when

passed from patient to patient, and not only do we rarely have any difficulty in persuading them to submit to the operation under local anesthesia, but as a rule they demand it and many come to us because of its use. Where one operation has been done under the local method, and a second becomes necessary, general anesthesia is never requested, but the local is insisted upon. Age and sex matter little. Our youngest case was nine years of age, the oldest ninety-seven. Exact figures have not been compiled, but our cases now number many hundred.

From the standpoint of the patient the advantages are evident. While absolute freedom from post-operative nausea and distension is not claimed, both are certainly lessened and, provided sufficient care is taken in the pre-operative preparation of the patient and in the handling of tissues, especially the parietal peritoneum, during the operation itself, they may be reduced to a minimum. I am thoroughly convinced that the preliminary hypodermic of morphia is responsible for much of the distension and nausea. The preparatory treatment should be the same as for a general anesthetic, with this exception, that a cup of coffee or a glass of milk may be given just before the operation. During the operation itself water may be taken freely and the patient is often allowed to smoke. It was at one time our custom to allow a resumption of normal diet shortly after the operation. It has been found, however, that this is not a good plan and that it is much better to limit the diet to liquids for the first twenty-four hours. Retention of urine is almost unknown and may be entirely avoided by keeping the patient in bed for twenty-four hours before the operation and educating him to the use of the urinal. There is some post-operative pain which usually appears within the first two hours and necessitates a small hypodermic of morphia, which should not be withheld.

As to the immediate results, healing is better than under general anesthesia, due most likely to the more careful handling of tissues. We have had no deaths and no post-operative pneumonias. A comparison of our ultimate results with those obtained under general anesthesia would be of no value; for it must be remembered that operations under local anesthesia have been done at a time when our knowledge of the necessities of successful hernia operations is so much better developed. There is no doubt, however, that every step of the operation can be as carefully and thoroughly executed under local as under general anesthesia.

From the standpoint of the operator dissatisfac-

tion may be attributed primarily to hurry or lack of time, and secondly to insufficient familiarity with the details and requirements of local anesthesia. These operations undoubtedly require more time than when the patient is unconscious, but with increasing experience the time limit is reduced. Great speed, however, is obtained at the expense of pain, and the time required for an ordinary inguinal, femoral or umbilical hernia can with difficulty be brought under an hour. Naturally this is prohibitive where many cases are scheduled for one day. Another objection is the wear and tear on the operator; for one is more fatigued by the additional strain of the careful dissection and the effort to converse with the patient—a faculty which, however, is soon acquired by practice.

It is not necessary to describe those details which are essential in all local anesthesia operations; but suffice it to say that the patient should be in a comfortable position on a well padded table and quiet as far as possible should prevail in the operating room. The most satisfactory apparatus is the graduated Record syringe, glass with metal piston, of a capacity of 10 and 20 c.c., with nickel needles of varying size and length. In the great majority of our cases in the past cocaine has been the anesthetic; but this is rapidly being discarded in favor of the less toxic novocain. In either case adrenalin is added to intensify and prolong the drug action and to prevent absorption. One-tenth of one per cent. cocaine is sufficient for infiltration and one-half to one per cent. for injecting the nerves; or one-half per cent. novocain for infiltration and one to two per cent. for nerve injection. We have never seen toxic effects from cocaine in even the most extensive operations; but novocain solutions being so easily prepared and having the advantage of less toxicity, are certainly to be preferred.

We will describe the technic of the operations which have proven best in our hands for the various forms of the usual hernias with the idea of showing the use of the local anesthetic in the different steps rather than to exploit any particular type of operation.

INGUINAL HERNIA.

As was beautifully shown by Cushing, the inguinal region is especially adapted to regional anesthesia because of the fact that it is almost entirely supplied by two nerves, the ilio-hypogastric and the ilio-inguinal, which can be readily reached for blocking. It has been our custom to follow the method of Cushing and to anesthetize the skin separately. According to Braun the whole injection

ternal oblique and conjoined tendon and possibly the edge of the sheath of the rectus muscle as close as possible to the pubic spine. Passing under the cord the cremaster is again picked up and the needle is introduced from within through the lower part of Poupart's ligament close to the pubic spine on the outer side. The needle is now carried back through cremaster, under the cord, and the suture is tied. Three or four of these are placed beneath the cord, bringing over the internal oblique to the under surface of Poupart's ligament. In the case of muscular weakness or atrophy of conjoined tendon the rectus is readily transplanted without further application of the anesthetic. In direct hernias the sac offers more difficulty because of the surrounding fat, and here we always transplant the rectus. It may sometimes be necessary to divide the epigastric vessels in order to thoroughly free the neck of the sac in direct hernias. The row of deep stitches is continued upward until strong internal oblique muscle is sutured to Poupart's ligament beneath the cord. One similar stitch is taken above the cord. As a rule when these are all placed the point at which the sac is attached can be seen well above the last suture. The cord and the two nerves which have been carefully protected are allowed to drop back into place on top of the internal oblique. The lower flap of external oblique is brought over the cord and sutured to the anterior surface of the internal oblique with fine linen, silk or catgut. The upper flap is overlapped and sutured to the anterior surface of the lower flap with similar material. The deep fascia may be brought together by two or three sutures of catgut and the skin is closed with a running through and through fine silk stitch. Ordinarily a small protective wick is brought out at the lower end of the incision. This has never given trouble and is removed at the first dressing, which is done from the eighth to the tenth day. Iodine preparation is ordinarily used and a dry gauze dressing over which a starch bandage is placed in order to prevent unusual motion for the first few days. Distention is relieved by enemata and the bowels usually moved in forty-eight hours. The patients are allowed to be turned immediately after the operation; but are kept flat in bed for about ten days, when they are gradually propped up and are allowed out of bed in from two weeks to sixteen or seventeen days. This usually means a maximum hospital stay of about three weeks, with a period of discomfort which rarely lasts through the first forty-eight hours and in most cases does not exist.

RECURRENT HERNIAS.

These offer little more difficulty as far as obtaining anesthesia is concerned. The incision must be carried higher in order to expose the nerves well above the old scar. These being injected, the operation may be carried out with as great precision and as much ease as where general anesthesia is used. The method of injecting the nerves separately after their exposure is in these cases undoubtedly much more satisfactory than a diffuse injection through several points before the skin incision is made; for the scar of the previous operation renders a diffuse injection most difficult. In very fat subjects it may be difficult to locate the nerves, but by first dissecting off the layer of fat which surrounds them they may be readily exposed. Recurrent hernias naturally offer greater difficulty from a technical standpoint because of the scar tissue and the fact that often one is not familiar with the nature of the operation which has been done before.

FEMORAL HERNIA.

The femoral hernia offers a good field for the diffuse primary infiltration of Braun, although here also we use a separate skin injection. The line of incision extending perpendicularly over the femoral canal is injected thoroughly with a weak solution and through this the needle is thrust all about the prominence of the hernia. Care has to be taken not to injure the femoral vein which lies in close apposition. The needle is also carried through the external oblique above Poupart's ligament and a diffuse injection made beneath this muscle to block fibres of the ilio-hypogastric and ilio-inguinal which may run into the femoral region. Dissection of the sac is then very readily accomplished. When the sac is dissected free a second injection should be made close about the neck of the sac and this should be carried well up within the femoral ring in order that a high ligation of the sac may be made. The contents of the sac may then be treated in the same way as in an inguinal hernia and the same precautions observed as to dragging on the mesentery. We have resected small intestine with good result in a patient eighty-four years of age in a strangulated femoral hernia. The sac being opened and its contents disposed of, the neck is thoroughly freed and ligated as high as possible with a purse-string suture of fine silk. The lower portion is removed and the stump allowed to retract within the femoral ring. The closure of the femoral ring involves no sensitive tissues and the sutures can be placed with absolute freedom from pain. One or more mattress sutures pass through Poupart's ligament picking up pectineus muscle or

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F. HOFFER McMECHAN, A.M., M.D., Editor
Cincinnati, Ohio, U.S.A.

October Introductory Number A.D., 1914

*"Frier Laurence. Take thou this vial,
And this distilled liquor drink thou off,
Which, presently, through all thy veins shall run
A cold and drowsy humor; for no pulse
Shall keep his native progress, but surcease;
No warmth, no breath, shall testify thou livest;
The roses in thy lips and cheeks shall fade
To pale ashes, thy eye's windows fall,
Like death, when he shuts up the day of life;
Each part deprived of supple government
Shall, stiff and stark and cold, appear like death,
And in this borrowed likeness of shrunk death
Thou shalt continue two and forty hours,
And then awake as from a pleasant sleep."*

Rowley and Juliet.

INTRODUCTORY.

The editorial policy of this SUPPLEMENT will be one of *service*.

For the first time in the history of medical journalism a journalistic medium is being provided for advancing the science and practice of anesthesia and analgesia, and for improving the status of the anesthetist. Needless to say the energies of the EDITOR and his ASSOCIATES will be devoted to making the SUPPLEMENT subserve the useful purposes for which it has been founded.

Primarily established as a medium for progressive anesthetists, medical and dental, and their organizations, for the exchange of experiences and the comparison of methods, the SUPPLEMENT is also intended to actively serve the interested surgeon, and to be a complete and reliable source of practical information for the large body of practitioners who include the administration of general anesthesia and the use of local analgesia among their accomplishments.

To maintain an editorial policy of *service*, the EDITOR requests those interested to favor the SUPPLEMENT with their original contributions, clinical or experimental, first hand; and he cordially invites associations of anesthetists to utilize the SUPPLEMENT for the publication of their transactions.

In conclusion the editor wishes to extend his heartiest thanks to those whose assistance has made the issuing of this SUPPLEMENT a possibility, and to acknowledge his debt of gratitude to those associates, who by their personal co-operation are giving the SUPPLEMENT a national and international scope. Also the editor solicits the continued support of all those who may appreciate the *service* which the SUPPLEMENT will provide.—F. H. M.

A MARTYR TO THE CAUSE OF MEDICAL KNOWLEDGE.

A fact scarcely known, but well worth recording, is that the American edition of Prof. Dr. Heinrich Braun's "Die lokal Anästhesie" cost the translator his life.

Dr. Percy Shields, of Cincinnati, spent a number of months with Prof. Braun in his clinic at Zwickau studying the most recent advances in analgesia. On returning home his health failed him, but he guarded the secret closely from his family and most intimate friends. His personal diagnosis of leukemia was later corroborated by experts at Johns Hopkins.

Had Dr. Shields then elected invalidism he might have prolonged his life indefinitely; but with a true scientist's disregard of fate he plunged into the work at hand, and spent the very remnants of his vitality in accomplishing his purpose.

He spent the silent watches of the night at his desk, pen in hand, his sole companion the Grim Reaper opposite, both watching the sifting sands in the hour-glass of life. Nor did Dr. Shields falter or complain. When the pen fell from his lifeless fingers, death picked it up and wrote "Finis" to his task. He was denied even the consolation of seeing his work in print. The editing of the manuscript and proofs was completed under the friendly auspices of Dr. Otto Juettner, the medical historian.

In behalf of the world's progress one man sacrifices existence to conquer Culebra cut; another becomes a martyr to the cause of medical knowledge. It is the heroism of workaday life that transcends the glories of war and the honors of pomp and circumstance.

Would that each of us could be as one of these.

F. H. M.

sufficient to say that in this issue the author has omitted much material that has become obsolete since the last edition, and has included ample descriptions of the newer procedures of anesthesia and analgesia, the various methods and apparatus that have made the administration of anesthetics more complicated and correspondingly more precise. He explains, for example, the rationale of Meltzer's intratracheal insufflation, illustrates several of the apparatus devised for its employment, and describes both the indication and the technique. Nitrous oxide-oxygen narcosis is accorded the space that this method has, in recent years, come to deserve. Spinal and regional anesthesia are considered at length, and many new illustrations have been introduced to make clearer their precise administration. The employment of alkaloids of opium and hyoscyamus in narcosis is also briefly reviewed. As before, the work aims to teach the scientific, rather than the routine in anesthesia methods, to establish reasons rather than mere rules.

Local Anesthesia. By Dr. ARTHUR SCHLESINGER, Berlin. Translated by F. S. ARNOLD, B.A., M.B., B.Ch. (Oxon). Duodecimo; 211 pages; illustrated. New York: KEBMAN Co., 1914. Price, \$1.50.

This small work should prove a very useful one for beginners in the field. It deals with the subject from a purely practical standpoint, so those interested in the theory or the chemistry of local anesthetics must seek detailed information elsewhere.

The work is up-to-date in nearly every respect and the logically established views of the author are clearly set forth. The only important adverse criticism that can be made of the book is that the translator has adhered too closely to the German form, and, in consequence, sentences are encountered here and there that are very ungainly or almost unintelligible.

Index and Abstracts

A Résumé of the International Current
Literature of Anesthesia and Analgesia.

EDITOR'S NOTE: Authors of pertinent articles, who desire to have them indexed and abstracted, are cordially invited to send copies of the journals containing their contributions, direct to the editor, immediately on publication. Also the receipt of reprints for filing and reference will be duly appreciated.

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AFTER-PAIN WITH LOCAL ANALGESIA. F. Honigsmann, Zentralblatt für Chirurgie, Leipzig, February 7, 1914.

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ANESTHESIA. L. Frank, Louisville, Kentucky State Medical Journal, March 15, 1914.

ANESTHETICS, ANESTHESIA AND THE ANESTHETIST. G. T. McCauliff, Webster City, Iowa State Medical Society Journal, February, 1914.

ANESTHETICS. W. N. Lynn, Knoxville, Tennessee State Medical Association Journal, February, 1914.

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ANESTHETIST, DIFFICULTIES WITH WHICH HE HAS TO CONTEMPLATE. R. W. Hornabrook, Practitioner, London, June, 1914.

ANESTHETIC AGENTS, OUR GENERAL, ETHER AND NITROUS OXIDE. W. C. Woolsey, Brooklyn, Long Island Medical Journal, February, 1914.

ANESTHETIST, STANDARD EDUCATIONAL QUALIFICATIONS FOR THE. R. C. Coburn, New York, Medical Record, February 21, 1914.

Anesthetics and Diagnosis. J. BLUMFELD, *Lancet*, March 28.

In a lecture delivered at the Medical Graduates' College and Polyclinic, Blumfeld lays stress on the fact that the administration of an anesthetic may be the chief step in making a correct diagnosis, not merely by allowing of an examination which was previously impossible without it, but also by providing fresh symptoms through the observed behavior of the patient during anesthesia. On one occasion, Blumfeld saw respiratory trouble arising during anesthesia, led to the detection of a mediastinal tumor, which had caused no symptoms in the conscious patient.

An examination with the abdominal wall thoroughly relaxed and just previous to operation, will often enable the surgeon to modify his preliminary diagnosis as to the organ affected or the location of tumor masses. It is inconvenient to make a gridiron incision for appendectomy and find a carcinoma of the sigmoid that can be removed only through another incision.

Again, it is frequently possible under an anesthetic to make out secondary deposits that preclude a successful operative interference, and also to differentiate carcinoma of the transverse colon from an enlarged gall-bladder.

While phantom tumors may enlarge during the excitement stage of anesthesia, they slowly melt away under the examining hand, when a plane of surgical narcosis has been reached.

Blumfeld draws attention to this unique point of differential diagnostic significance, that under anesthesia, particularly in chronic cases coming to operation, the pathological seat of trouble will be found under that part of the abdominal wall where rigidity persists. Thus he has seen duodenal ulcer differentiated from appendicitis, and the correct incision made after an examination under deep narcosis, during which the upper portion of the rectus muscle remained rigid in spite of the anesthetic. He suggests that in such instances portions of the muscle may undergo fibrotic changes as a protective action on the part of nature.

He quotes a personal observation in which under an anesthetic a gynecologist changed his diagnosis from an ovarian cyst complicating pregnancy, to a cyst complicating a fibroid tumor, the cyst, remarkable to say, having been considered the pregnant uterus.

Respiratory trouble under anesthesia in another gynecological case led to the discovery of a band attached to the cervix, which made traction upon a certain portion of the cul-de-sac and caused considerable pain to the conscious patient.

Blumfeld also reiterates the importance of examinations under an anesthetic in hemorrhage from the vagina or rectum in order to rule out carcinoma.

ANESTHETIC TENSION OF ETHER VAPOR IN MAN, DETERMINATION OF. Mode of Action of Common Volatile Anesthetics. W. M. Boothby, Boston, Journal of Pharmacology and Experimental Therapeutics, March, 1914.

ANESTHETIZATION.—ANESTHETIZER AND SURGEON. R. L. Charles, Denver, Colorado Medicine, June, 1914.

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ANOCI-ASSOCIATION, TECHNIC AND RESULTS OF. H. G. Sloan, Cleveland, *Lancet-Clinic*, January 3, 1914.

ANOCI-ASSOCIATION AND CANCER OF THE CERVIX. E. W. C. Bradfield, Indian Medical Gazette, April, 1914.

ANOCI-ASSOCIATION—PREVENTION OF SHOCK AND POST-OPERATIVE PAIN. A. B. Cooke, Los Angeles, *Journal American Medical Association*, June 6, 1914.

ANOCITHESIA—PAINLESS SURGERY. C. A. L. Reed, Cincinnati, Medical Record, March 7, 1914.

CALIBRATION OF WALLER GAS BALANCE AND CONNELL ANESTHETOMETER. W. M. Boothby and J. Sanford, Boston, *Journal of Pharmacology and Experimental Therapeutics*, March, 1914.

CELL-DIVISION, ACTION OF ANESTHETICS IN SUPPRESSING. R. S. Lillie, Woods Hole, Mass., *Journal of Biological Chemistry*, March, 1914.

CHLOROFORM ANESTHESIA IN THE LIGHT OF PHYSIOLOGICAL RESEARCH. G. H. Clark, Glasgow Medical Journal, January, 1914.

CHLOROFORM TOXICITY AND HEPATIC NEUROSIS, INFLUENCE OF DIET ON. E. I. Opie and L. B. Alford, St. Louis, *Journal American Medical Association*, March 21, 1914.

COUNTRY PRACTITIONER, ANESTHESIA FROM THE STANDPOINT OF. J. F. Auner, Waverly, Iowa, *State Medical Society Journal*, June, 1914.

Cocaine, Dosage of, and Other Drugs Used For Local Analgesia. A. H. MILLER, Providence, R. I., *The Journal of the American Medical Association*, January 17.

Miller reported 103 cases to the Providence, R. I. Society of Anesthetists, in which alypin had been used as a local analgesic. Of these, thirty-five were minor surgical operations and sixty-eight genito-urinary. In one hundred of the cases analgesia was perfectly satisfactory, in two the analgesic caused serious difficulty and in one instance death. In the last case the patient was an apparently healthy adult, thirty-nine years of age, who was about to undergo dilatation for stricture of the urethra. About two drachms of a 10 per cent. solution of alypin were introduced into the urethra and bladder. Two minutes later he had a general convulsion. A half-dozen similar convulsions occurred during the next ten minutes, with cessation of respiration and stopping of the pulse. Artificial respiration and stimulation were tried without avail.

In another instance an adult was about to have sounds passed for retention of urine. An unmeasured quantity of a 10 per cent. solution of alypin was introduced into the urethra. In about five minutes the patient had a general convulsion, respiration ceased and the pulse became imperceptible. The patient was revived after about two hours' work. In the third untoward case about one and a half drachms of a 10 per cent. solution of alypin was introduced into the urethra and bladder for dilatation of a stricture. In three minutes the patient became unconscious, and respiration became embarrassed, but the pulse remained good. Artificial respiration and inhalations of oxygen brought this patient around in about ten minutes.

These experiences emphasize the necessity for great care in the dosage of local analgesics. High percentage solutions are always dangerous. A fact that urologists overlook is the extremely rapid absorption of local analgesic drugs from the urethra and bladder into the general circulation. Those interested should try a liberal dose of adrenalin or eserin on per urethra to note this peculiar rapidity of absorption and the disastrous systemic effects of potent drugs thus administered.

With regard to alypin, Brennermann's technic of depositing a tablet of the drug at the point of analgesic localization is far preferable to throwing an unmeasured quantity of the 10 per cent. solution into the urethra or bladder.

DEATHS AND FATALITIES, SECONDARY ANESTHETIC. George Keil, *Deutsche Medizinische Wochenschrift*, May 14, 1914.

(DEATHS) SURGICAL MORTALITY FROM STANDPOINT OF THE ANESTHETICIST. H. W. Kearney, Washington, D. C., *Washington Medical Annals*, May, 1914.

(DEATHS) ANESTHETIC FATALITIES AND INJURIES, MEANS OF LESSENING. R. F. Patterson, Nashville, Tennessee, *State Medical Association Journal*, February, 1914.

DEATH DURING ETHER ANESTHESIA, STATUS LYMPHATICUS. W. B. Howell, Montreal, Canada, *Journal American Medical Association*, March 28, 1914.

Deaths During Anesthesia, a Review of Inquests Concerning. R. FLEMMING, London, *Proceedings of the Royal Society of Medicine*, Section of Anesthetics, vol. vii, 1914.

Flemming has collected data regarding all instances of death under anesthesia reported in the English press from 1910-1913. The statistics are therefore far from complete. Of 700 cases recorded, the nature of the anesthetic used was ascertained in 542; in 521 of which the anesthetic seemed to have been more or less responsible in the causation of death. In 223 cases death is reported to have occurred before operation was begun. In at least 100 cases the severity of the operative interference was a factor in the consequent fatality.

Deaths from certain anesthetics occurred as follows: Chloroform, 378; Ether, 28; Mixtures, 100; Nitrous Oxide, 12; Ethyl Chloride, 6; Spinal, 8; Scopolamine, 2; Hedonal, 2; Local, 6; not specified, 158.

Among 338 persons the age ranged between twenty-six and sixty; in the remaining 124 it varied between six and fifteen.

Perhaps the only tenable conclusion that can be drawn from Flemming's data is the fact that chloroform is extremely fatal during the induction period of narcosis. The recent popularity of the drop method of etherization in England and on the Continent may soon modify statistics so that further deductions may be drawn.

Erroneous Deductions From Tracheal Insufflation.

RAYMOND C. COBURN, New York City, *New York Medical Journal*, June 20, 1914.

Coburn contends that less shock follows operations performed under in-sufflated ether, not because the latter protects better against shock than inhaled ether, but because tracheal insufflation relieves the extra burden thrown upon respiration, thereby conserving vitality. Crile's researches show that while neither ether nor nitrous oxide cause shock per se, still in the presence of trauma, brain cell exhaustion under ether is three times that which occurs under nitrous oxide anesthesia in the normal subject, and the proportion is greater in handicapped risks. Also ether by inhalation technics directly vitalizes the patient through respiratory restriction, and by the dissolving of the lipid in the cells of the blood, thereby embarrassing the eliminating and disintoxicating organs—the liver, kidneys, spleen, thyroid and adrenals.

Clinical experiences at Johns Hopkins prove conclusively that warm anesthetic vapor tends to conserve both the life and vitality of patients.

While indicators may be a guide in adjusting the apparent oxygen percentage in any given technic of administration, the proper degree of oxygenation and proper depth of anesthesia are the real factors that control the percentage adjustment.

Tracheal insufflation with increased pulmonary aeration without shock has led many observers to argue that acapnia is not a cause of shock.

While the increased intrapulmonary pressure of tracheal insufflation increases the alveolar oxygen tension, thereby facilitating oxygenation, the alveolar carbon dioxide tension is unaffected, as its percentage varies inversely with this pressure, and is not decreased unless there is an increase of alveolar ventilation. Intratracheal insufflation really produces a hypercapnia, necessitating, according to Meltzer's technic periodic interruptions, to partially deflate the lungs and thus increase alveolar ventilation, thereby removing the excess of accumulated carbon dioxide.

ETHER ANESTHESIA. W. C. Huyser, Kalamazoo, Michigan State Society Journal, June, 1914.

ETHER ANESTHESIA BY THE OPEN METHOD. F. R. Widdowson, Philadelphia, New Jersey State Medical Society Journal, May, 1914.

ETHER INTIMATION, EFFECT OF ON SKELETAL MOTOR MECHANISM. S. J. Meltzer and J. Auer, *Journal of Pharmacology and Experimental Therapeutics*, May, 1914.

EYE AND FACE OPERATIONS UNDER REGIONAL ANESTHESIA. R. and M. Danis, Brussels. *Ophthalmology*, January, 1914.

Perforation of the Root of an Impacted Maxillary Premolar.
 P. M. J. *Med. J. Aust.* 1954, 48, 134.
 A 17-year-old girl had a maxillary premolar impacted in the soft tissue of the upper lip. The tooth was impacted at an angle of 45° to the vertical. The root of the tooth was perforated by a needle. The tooth was removed by the method described by the author. The patient was treated with penicillin and sulphonamides. The tooth was removed without incident.

Hemorrhoids, Their Radical Treatment Under Local Analgesia. *The Dental Surgeon*, May 1954, 14.

Terrell was the first to describe an anal procedure for the treatment of hemorrhoids. He used a local anesthetic solution of procaine and adrenaline. The patient is reclined on the left side. The anal area is prepared with antiseptic solution. The hemorrhoid is exposed. The procedure is described in detail. The patient is treated with penicillin and sulphonamides. The hemorrhoid is removed without incident.

When the hemorrhoid is removed, the patient is treated with penicillin and sulphonamides. The hemorrhoid is removed without incident. The patient is treated with penicillin and sulphonamides. The hemorrhoid is removed without incident.

All anal procedures are performed under local anesthesia. The patient is reclined on the left side. The anal area is prepared with antiseptic solution. The hemorrhoid is exposed. The procedure is described in detail. The patient is treated with penicillin and sulphonamides. The hemorrhoid is removed without incident.

The superior results of this procedure are due to the use of local anesthesia. The patient is reclined on the left side. The anal area is prepared with antiseptic solution. The hemorrhoid is exposed. The procedure is described in detail. The patient is treated with penicillin and sulphonamides. The hemorrhoid is removed without incident.

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Hysterical Teething Analgesia. *The Dental Surgeon*, May 1954, 14.

W. A. M. *Med. J. Aust.* 1954, 48, 134.
 A 17-year-old girl had a maxillary premolar impacted in the soft tissue of the upper lip. The tooth was impacted at an angle of 45° to the vertical. The root of the tooth was perforated by a needle. The tooth was removed by the method described by the author. The patient was treated with penicillin and sulphonamides. The tooth was removed without incident.

High Pressure Analgesia. *The Dental Surgeon*, May 1954, 14.

The author describes a method of high pressure analgesia. The patient is reclined on the left side. The anal area is prepared with antiseptic solution. The hemorrhoid is exposed. The procedure is described in detail. The patient is treated with penicillin and sulphonamides. The hemorrhoid is removed without incident.

With a No. 1 needle, the patient is treated with penicillin and sulphonamides. The hemorrhoid is removed without incident. The patient is treated with penicillin and sulphonamides. The hemorrhoid is removed without incident.

The procedure is described in detail. The patient is treated with penicillin and sulphonamides. The hemorrhoid is removed without incident. The patient is treated with penicillin and sulphonamides. The hemorrhoid is removed without incident.

Perforation of the Root of an Impacted Maxillary Premolar.
 P. M. J. *Med. J. Aust.* 1954, 48, 134.
 A 17-year-old girl had a maxillary premolar impacted in the soft tissue of the upper lip. The tooth was impacted at an angle of 45° to the vertical. The root of the tooth was perforated by a needle. The tooth was removed by the method described by the author. The patient was treated with penicillin and sulphonamides. The tooth was removed without incident.

Hysterical Monoplegia Following Electric Shock Cured Under Anesthesia. *The Dental Surgeon*, May 1954, 14.

The patient was treated with penicillin and sulphonamides. The hemorrhoid is removed without incident. The patient is treated with penicillin and sulphonamides. The hemorrhoid is removed without incident.

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Intratracheal Insufflation, Proper Depth of the Tube in the Trachea. *The Dental Surgeon*, May 1954, 14.

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The fact that anesthesia may be maintained with the tube in the esophagus emphasizes the necessity for avoiding this contretemps, as the aspiration of blood and mucus would be facilitated instead of prevented, as it is in the proper technic.

A reliable evidence that the catheter is in the trachea is the encountering of an undoubted resistance while pushing the catheter downward. If the catheter can be pushed beyond a depth exceeding 33 cm. it has been introduced into the esophagus.

To obviate this mistake Mettler suggests that the catheter be marked at two points, 27 cm. and 35 cm., respectively; that the tube be introduced until it meets an obstruction at or near the 35 cm. mark, and then be withdrawn to the 27 cm. mark, and that the routine practice of introducing the tube only to a place above the tracheal bifurcation, without differentiating its real situation, be discontinued.

In conclusion Mettler points out the disadvantages of the catheter with lateral openings as against the increased efficiency of the tube with the opening at the end.

ISOPRAL RECTAL ANESTHESIA, DANGERS OF. P. Kleinschmidt, *Berliner Klinische Wochenschrift*, February 2, 1914.

KIDNEY, ACTION OF SPINAL ANESTHESIA ON. R. Mosti, *Gazzetta degli Ospedali e delle Cliniche*, Milan, xxxv, Nos. 30-33.

Larynx, A Method of Anesthetizing. COURTENAY YORKE, Liverpool, *British Medical Journal*, June 13, 1914.

Anesthesia of the larynx by novocain injections around the internal laryngeal nerves is of value when cocaine alone will not induce complete anesthesia, as in inflammatory and highly irritable conditions of the larynx; when deep anesthesia is required for actual cauterization, and when the patient is unduly sensitive to the toxic properties of cocaine.

The method was originally proposed by Frey in 1906, and Yorke has used a modified technic in 55 cases, including 9 with new growths of the larynx, 2 with singer's nodes, 2 with lupus, and the remainder with tuberculous laryngitis requiring the use of the actual cautery.

A preliminary hypodermic injection of morphine and atropine is advisable, and the palate, fauces, pharynx and base of the tongue are desensitized by the usual application of cocaine. A hypersensitive palate requires novocain injections in the neighborhood of the posterior palatine foramina, and the recalcitrant epiglottis and base of the tongue may be controlled by injections just above the hyoid.

Post-mortem dissections have convinced Yorke that previous methods are uncertain for anatomical reasons. Thrusting the needle in at right angles to the surface in an effort to reach the internal laryngeal nerve as it lies on the thyro-hyoid membrane just before piercing that structure, makes it difficult to locate the plane of the nerve, and places the great vessels in danger of puncture.

Yorke directs the needle along the course of the nerve from the point where it pierces the thyro-hyoid membrane to a point half an inch below the upper border of the thyroid cartilage. The solution is injected during the progress of the needle, and in this technic one inch or more of the nerve in a position easily accessible, is brought under the effect of the novocain.

To get the needle into the plane of the nerve it is entered so as to strike the great cornu of the hyoid one inch behind the lesser cornu; the point is slightly depressed until it hitches against the lower border of the great cornu, where it is in relation with the uncovered area of the thyro-hyoid membrane, and in a position to commence the downward and forward movement along the nerve.

There is very little likelihood of the needle entering the pharynx, until it sinks beneath the upper border of the thyroid, in which location it is important to keep in front of the sinus pyriformis. In the male, Yorke has found that the sinus pyriformis is one to one and a quarter, and in the female three-quarters to an inch from the middle line of the neck.

During the injection the patient lies in the recumbent position with the neck well extended to open up the thyro-hyoid interval. A strong, sharply pointed needle, two and

a half inches long, is employed, and the fluid used is a 5 per cent aqueous solution of novocain, to which a small quantity of adrenal is added. Twenty to thirty m. of this solution are injected into both sides. Quinine and urea hydrochloride similarly used has proved disappointing.

In the 55 cases thus anesthetized there was no hemorrhage or inflammatory reaction. The large vessels, if pressed back with the thumb are quite out of danger, and with aseptic precautions the risk of infection is insignificant.

LEGAL STATUS OF TRAINED NURSES IN ADMINISTRATION OF ANESTHETICS. A. C. Vandiver, New York Medical Journal, May 30, 1914.

LOCAL ANESTHETICS IN SURGICAL PRACTICE. D. Pellegrino, Rome, Policlinico, February 15, 1914.

LOCAL ANESTHESIA. R. Duffy, Plant City, Fla. Georgia Medical Association Journal, May, 1914.

Magnesium Narcosis, Investigation of. (*Untersuchungen über die Magnesiumnarkose*.) E. STARKENSTEIN, *Centralblatt für Physiologie*, XXVIII, 1914.

Since the initial laboratory and clinical researches of Mettler and Auer on anesthesia following the injection of magnesium salts, it has been a disputed point whether the phenomena observed was a true narcosis of central origin or a profound paralysis involving the peripheral nervous system. Combined in doses insufficient of themselves to induce anesthesia, Mettler and Auer found that magnesium and ether would produce narcosis without any evidence of peripheral paralysis. More recently Starkenstein has found that the irritability of the entire nervous system is depressed by magnesium ions. This is in line with the latest observations of Mettler and Auer that the decreased capacity of the skeletal motor mechanism to produce tetanus under ether anesthesia is in reality an increase of fatigability, more noticeable in nerve stimulation than in direct stimulation of the musculature, thereby indicating a curare-like action. Further investigation of Githens and Mettler have shown that the toxic action on the peripheral respiratory mechanism begins in the earlier stages of etherization, and that the phrenic nerve and the diaphragm lose a great deal of their irritability in the course of prolonged ether narcosis.

Primarily chloroform does not produce this same effect. The irritability of motor nerves to faradic stimulation persists, independently of the length of narcosis, under chloroform, unless the heart becomes profoundly affected from an overdosage or secondary complications such as anemia or asphyxia are present.

MENTAL AND INFRA-ORBITAL NERVES, BLOCKING OF, AT THEIR FORAMINA TO INDUCE OPERATIVE ANALGESIA IN THEIR CUTANEOUS DISTRIBUTION. P. G. Skillern, Jr., Philadelphia. Surgery, Gynecology and Obstetrics, March, 1914.

MOTOR NERVES, IRRITABILITY OF UNDER CHLOROFORM ANESTHESIA. T. S. Githens and S. J. Mettler, *Journal of Pharmacology and Experimental Therapeutics*, May, 1914.

NITROUS OXID-OXYGEN NOVOCAIN ANESTHESIA. W. E. Bannan, La Crosse, Wisconsin Medical Journal, May, 1914.

NITROUS OXID ANESTHESIA. H. M. Decker, Davenport, Iowa, *Ibid*.

NITROUS OXID-OXYGEN ANESTHESIA. A. H. Miller, Providence, R. I. New York Medical Journal, January 24, 1914.

Nitrous Oxid-Oxygen Analgesia. MOSES SALZER, Cincinnati, *O. The Dental Summary*, June, 1914.

Salzer points out the futility of attempting analgesia with nitrous oxid-oxygen alone in patients who are excessively nervous and do not want to be conscious of what is going on. Until they have been educated to the efficiency of gas-oxygen analgesia by several experiences, they should receive some preliminary medication as morphin, hyoscin or bromides.

In all cases in which pain, caused by the dental manipulation itself, is responsible for the patient's dread or nervousness, gas-oxygen analgesia is marvellously efficient.

sists that if the breath cannot be held more than twenty seconds, the patient should be operated on under analgesia, or his systemic condition be first improved. He quotes some American insurance companies who do not consider any candidate a good risk who has a respiratory test below forty.

In this connection it is interesting to note that Yandell Henderson in the *Journal of the American Medical Association*, July 25, has a preliminary communication on "The time that Breath can be Held as an Index of Acidosis."

While Stange seems to have no suspicion that his test is based on an apnea due to acidosis, nevertheless he reports observations on a number of chronic diseases in which he finds the duration of voluntary apnea to be abbreviated in about the degree, in which acidosis is known, from the results of other observers, to occur. Lewis, Ryffel, Wolf, Cotton and Bancroft have recently shown that the dyspnea of nephritis is due to an acidosis essentially like that developed in normal persons at great altitudes. Keneway, Pembrey and Poulton have found that by following the alveolar carbon dioxide in diabetics, a warning drop in its tension indicates the approach of coma as long as forty-eight hours before hand and longer than any other method.

Thus voluntary apnea due to acidosis, diagnosed by this simple respiratory test, will serve as a warning to the anesthetist and operator in handling diabetic, cardiac and renal risks.

PROSTATECTOMIES (17) UNDER EXCLUSIVE LOCAL ANALGESIA. F. Legueu, Paris, *Journal d'Urologie*, June, 1914.

Prostatectomy Under Local Anesthesia. C. W. ALLEN, New Orleans. *New Orleans Medical and Surgical Journal*, February, 1914.

The technic developed by Allen is as follows: One hour before operation a suppository containing 10 grains of anesthesin is placed in the rectum to anesthetize this region and prevent any discomfort when the finger is introduced to elevate the prostate. At the same time a hypodermic injection of morphia 1-6 grain and scopolamine 1-150 grain is administered to lessen psychical disturbances. The bladder is opened under local anesthesia and its walls retracted by long, deep retractors, bringing the field of the prostate into view. Points below the opening of the urethra, near the base of the gland on either side, are selected for injection on the vesical surface. The needle is passed through the mucosa with the idea of making the injection between the true and false sheath of the prostate, as it is in this plane that the solution must diffuse around the gland and the enucleation is effected. It is here that the large venous plexuses are situated and the nerve filaments are more easily reached as they pass through to the prostate.

Two or three drams of a 1/2 per cent novocain solution, containing 15 minims of adrenalin to the ounce, are injected at the points mentioned. The needle is then passed into the urethral opening and the lateral walls are similarly injected. An additional injection may be made at the point where very large glands project above the urethral opening. Analgesia is established within five minutes, during which period the adrenalin blanches the prostate. The solution does no harm if injected directly into the gland, but the analgesia is not as effective as when infiltration occurs peripherally between the true and false sheath of the prostate.

This technic blocks all shock from surgical trauma, controls hemorrhage and obviates the systemic complications of general anesthesia, hence its efficacy in reducing the already low mortality in prostatectomy, particularly in bad risks that have had the additional security of preliminary bladder drainage in the two-stage operation.

RECTAL NECROSES AND OFFICE OPERATIONS, LOCAL ANALGESIA IN. J. D. Reeder, Maryland Medical Journal, February, 1914.

RECTAL ANESTHESIA, DANGERS OF ISOPRAL FOR. P. Kleinschmidt, *Berliner Klinische Wochenschrift*, February 2, 1914.

RECTAL CASES UNDER LOCAL ANESTHESIA. J. F. Saphir, *New York Medical Journal*, May 9, 1914.

RESEARCH, ANESTHESIA IN SURGICAL. B. F. McGrath, Rochester, Minn., *Surgery, Gynecology and Obstetrics*, June, 1914.

RESPIRATION, NATURE OF THE CESSATION OF DURING DEEP ETHER ANESTHESIA. T. S. Githens and S. J. Meltzer, *Journal of Pharmacology and Experimental Therapeutics*, May, 1914.

Sacral and Local Anesthesia For Laparotomies. M. TRAUGOTT, *Munchener Medizinische Wochenschrift*, May 12, 1914.

Traugott advocates the following preliminary medication: The evening before the operation the patient receives 0.5 gram of veronal; one and a half hours before the operation a combination of pantopon-scopolamine is injected subcutaneously, the dose being repeated one-half hour before operation, or during the operative procedure if the patient becomes restless.

The spinal injection is made with the patient in the knee-chest position. If bleeding occurs through the trocar, the needle is slightly withdrawn and the body of the patient elevated. Ten to twenty c.c. of salt solution are injected, followed by an equal amount of a 1 per cent novocain solution, the pulse and respiration being carefully observed.

The accidental injection of the novocain solution into a vein causes immediate acceleration of the pulse and respiration.

The technic was applied in a long series of laparotomies, including hysterectomies, appendicectomies, nephrectomies and ovariectomies, and in fifty per cent of the cases the sacral analgesia was completely satisfactory. In 38 per cent an additional volatile anesthetic had to be administered, and in 6 per cent the method had to be abandoned owing to pain and the failure of the musculature to relax.

SACRAL ANESTHESIA: EPIDURAL INJECTIONS. E. Zweifel, *Munchener Medizinische Wochenschrift*, March 31, 1914.

SPINAL ANALGESIA. J. M. Bartrina, *Presse Medicale*, January 3, 1914.

SPINAL ANESTHESIA WITH NOVOCAIN. S. Mercade, *Journal de Chirurgie*, January, 1914.

SPINAL ANESTHESIA, EXPERIENCES WITH IN PELVIC SURGERY. B. M. Ansapach, Philadelphia, *American Journal of Obstetrics*, May, 1914.

SPINAL ANALGESIA AND SHOCKLESS OPERATIONS. J. Moley, *Medical Chronicle*, Manchester, January, 1914.

Submucous Resection of the Nasal Septum, Satisfactory Local Analgesia For. J. J. KING, New York City. *Journal American Medical Association*, May 30, 1914.

Following a preliminary dose of scopolamine, 1-150 gr., one-half hour previous to operation to allay nervousness and act as a therapeutic antagonist to cocaine, King, with a cotton-wool applicator, applies a 20 per cent solution of cocaine over every part of the mucous membrane of the septum, the application being immediately repeated. This is succeeded by a similar application of a 1:1,000 epinephrin solution. Then 8 to 10 c.cm. of sterile salt solution, to which 5 minims of a 1:1,000 epinephrin solution have been added, are injected under the septum perichondrium and periosteum on each side. This infiltrates every portion of the septum membrane, blocks off the nerves, prevents shock and renders the operation practically bloodless. It also aids in elevating the perichondrium from the cartilage, thereby facilitating dissection. King limits himself to 5 minims of the epinephrin solution, as this dose is well within the toxic limits of the drug, and is sufficient to render the operative field bloodless.

TOXICATION, INCREASE OF ETHER, BY NEW METHOD OF ADMINISTRATION. R. C. Coburn, New York, *Journal American Medical Association*, January 31, 1914.

TONSILLECTOMY IN THE UPRIGHT POSITION UNDER ETHER. W. H. Roberts, Pasadena, Cal., *Laryngoscope*, February, 1914.

UROLOGY, REGIONAL AND LOCAL ANALGESIA IN. G. Le-moine, *Journal d'Urologie*, May, 1914.

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BONE TRANSPLANTATION WITH GENUOUS SLIDING GRATES AND BONE NAILS

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The operation herein described combines advantageous features of various operations, together with a few original procedures. It seems to fulfill most satisfactorily the demands in certain types of ununited fracture, especially fracture of the tibia, and it does away completely with the necessity of cutting into the legs, thus reducing the danger of infection to almost zero limit. It provides for adequate fixation of the transplant with out the introduction of any metallic or other foreign body. The whole procedure is the evolution of an effort to do away with the insertion of all types of unabsorbable material, because of the necessity for its later removal in a large percentage of cases, and because it is apparently proven that, though efficient and sound in many bone cases, bone union in the presence of foreign material is usually delayed. Further, the operation finds its greatest usefulness in case where union by plate or wire has signally failed. The sliding transplant has also been used in recent cases with most satisfactory results.

The method is illustrated by a study of the case shown in figure 1 and 2. The man had a badly comminuted fracture of the lower third of the tibia with a simple fracture of the upper third of the fibula (Fig. 1). An adequate operation was decided upon and performed August 25, 1943. Numerous fragments were removed and the largest of them placed in the olecranon. The left gap in the bone nearly six inches in length. To fill this gap a long bone splinter was trimmed and driven into the medullary cavity of the upper and lower fragments. The final dressing treatment was given with the Murr's method. A radiograph of October 9, 1943, in the seventh week after operation is shown in figure 2. Attention is called to the enormous bony calli completely surrounding the graft and more than filling the gap in the bone. There was no post-operative union and absence of infection. The removal of the olecranon from

this case resulted in the operation illustrated in figures 6 and 7.

It seemed logical to presume that a bone graft might be taken from a healthy section of the fractured bone and transplanted to the desired area, and that the gap left would heal while the fracture healed. Disability of the other limb and added suffering of the patient could be prevented and



FIG. 1. P. W. M., 30 years old. Fracture of tibia and fibula.

the danger of infection reduced. Experimental work resulted in the evolution of the living bone nail, taken also from the fractured bone.

The first complete sliding graft of autogenous bone nails was made January 28, 1944, at St. Luke's Hospital, for an ununited fracture of the tibia of three months' standing (Fig. 3). The result was pleasing and the patient walked without support in eight weeks. The condition of a clinical case, 1944, is shown in figure 4, and a March 20, 1944, in figure 5.



FIG. 2. P. W. M., 30 years old. Fracture of tibia and fibula.

Similar cases of all types of fractures of the long bones of the limbs have been treated with the same method. The results have been most gratifying. The method described here is a new one, and one that will undoubtedly become a standard procedure. *Medical Record*, March 1, 1944.

It will be noted that a special effort was made to reduce the fracture, and to surround the graft and medullary canal of one fragment with bone. By the removal of the olecranon, the olecranon

strength is thus provided for. The bone nails are trimmed squarely and driven in $\frac{1}{8}$ -inch round holes, utilizing the principle of the square boat nail for greater holding power.

The technic of the operation is as follows:

Pre-operative. Forty-eight hours before opera-



Fig. 3. (H. T. C.) Ununited fracture of the tibia of three months' standing. Operation January 28, 1914.

tion the limb is carefully cleaned with tincture of green soap and water, using gauze sponges, never a brush. A safety razor is used for shaving, taking care not to cut or scrape the skin. The field is then washed for five minutes with alcohol, and a thick dressing wet with a solution of mercuric iodide, 1-20000, is applied and kept constantly moist. (For convenience and accuracy in preparing the solution, McClintock's germicidal discs are used.)

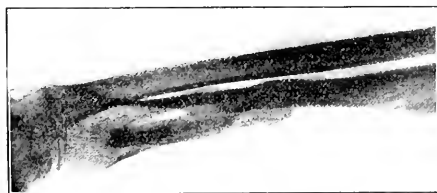


Fig. 4. (H. T. C.) Result February 20, 1914, showing the autogenous sliding graft driven into the prepared medullary canal below, imbedded above, and held by an autogenous bone nail. Callus beginning.

The evening before operation the first dressing is removed, the field again washed with alcohol and a fresh wet iodide dressing applied, to be kept moist and left undisturbed until removed in the operating room.



Fig. 5. (H. T. C.) Same case as figures 3 and 4. Radiograph taken March 20, 1914, showing sound, smooth union. Patient walking.

Operating room preparation. The wet dressing is removed and, if work is to be done on the tibia

for instance, the entire foot, leg and lower third of the thigh are wiped with iodine in benzene, then painted with 3½ per cent. tincture of iodine. After the latter coat has dried, the excess is wiped away with alcohol sponges. All applications are made with gauze held in long-handled forceps. Fingers do not touch skin, sponges or anything that comes in contact with the operative field.

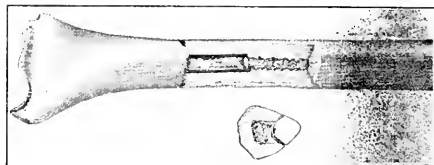


Fig. 6. Showing space left in bone after sliding graft has been cut out. Medullary canal of upper fragment chiseled out to receive prepared graft. Cross section shows direction of saw or chisel cuts in removing graft. Dotted lines show approximately extent of vivification of medullary canal.

A sterile towel is wrapped around the leg; the foot and the knee and lower thigh are bandaged with sterile gauze bandages (Fig. 8). To totally eliminate finger contact, the bandages may be rolled on 6-inch glass rods, sterilized, and applied by holding the rod, without having been touched by fingers.

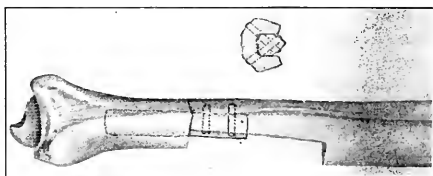


Fig. 7. Lateral view showing sliding bone graft driven into reamed out canal below, imbedded in prepared channel above, and held with living bone nails. Cross section shows direction of drill holes and nails through imbedded transplant and bone. Placed at right angles to each other the holding power of two nails is efficient.

A straight cut with a knife is made through towel and skin and superficial fascia. The edges of the towel are then fastened to the edge of the cut skin; the skin, with its potentialities for wound

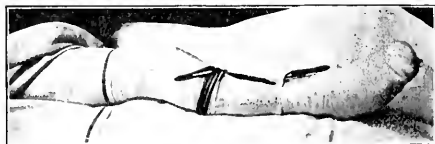


Fig. 8. Leg prepared for operation—covered by sterile towels, foot and knee bandaged. After skin incision the borders of the slit in the towel are fastened to the skin edges with Michel clips. The tenacula shown are no longer used since in placing them they must necessarily have been touched by fingers.

contamination, is thus eliminated. We first fastened the towel, or gauze, or rubber dam to the skin edges with small tenacula, later with silkworm gut,

thereon four sliding pronged retractors (Fig. 9). It will be noted that two sizes are used—the long prongs for thigh work, the short prongs for work about legs and forearms—two, three or four of the prongs may be employed, and the wound adjusted at will.

Technic of sliding transplant. The bone having been thoroughly exposed the fracture area is cleared and elevated, and in old cases the excess of callus is cut away. The bone ends are trimmed so that they will approximate nicely.

The short fragment is elevated and its medullary cavity reamed out; care must be exercised in old cases that the freshening extends well beyond the area of sclerosis into healthy bone. The transplant must be taken from above or below the sclerosed area. It is cut from the long fragment, by chisel or electric saw, as shown in figure 7. The cuts should slant downward and inward toward the medullary canal and should be started about $\frac{3}{8}$ inch each side of the crest. This should give a total width through the center of the graft of at least $\frac{1}{2}$ inch. In old cases the sclerosed ends are cut away.

The medullary canal of the long fragment is gouged or chiseled out as shown in figure 6. The graft is then trimmed so that it will drive snugly into the reamed medullary canal and imbed firmly in the groove in the other fragment with the crest up.

This cutting and fitting may be done with saw or biting forceps, but I have found that a vise and an ordinary cabinet maker's rasp render the work both easy and rapid. An ordinary iron vise, purchasable at any hardware store for 75 cents, and nickel-plated at a cost of 50 cents, is quite satisfactory.

The graft having been placed and the fragments approximated, the transplant and bone are drilled with $\frac{1}{8}$ -inch or 3/16-inch drills, and nailed with bone nails. The nails are fashioned with bone-cutting forceps and rasp from splinters which have been cut from the bone at the time the graft is removed. In the tibia, we have found it best to take material for bone nails from the side of the bone rather than the crest, since the latter is denser and more brittle.

The wound is closed with Michel clips, a carbolic dressing is applied, and the limb put up in plaster, taking care to immobilize joints above and below the fractured area.

The ring method of holding transplants. This method is applicable to single round bones. The medullary canals of both fragments are reamed out. The graft is lifted from the bone far enough

away from the fractured area so that a ring at least one inch in width is left. The graft is then inserted as in the usual intra-medullary operation; no nail, wire suture is necessary.

This method may be used in any case where both fragments can be elevated, and it is also applicable to cases where moderate gaps exist.

In bone transplantation, particularly in intra-medullary bone grafting, some consideration of the size and thicknesses of bone, especially of the tibia, and diameter of the medullary canals seems important.

Attention is called to the tibial cross sections shown in figure 11. The varying sizes of the canal and thicknesses of bone from which grafts may be taken are worthy of notice.

We have tried several dowel cutters, but have found them impractical in tibial work because of the difficulty of getting bone of sufficient thickness to make round dowels large enough to fill the medullary canal except in the middle third of the bone. A transplant trimmed to an exact fit with the rasp seems to fulfill all requirements.

THE SEVENTH INTERNATIONAL CONGRESS FOR OBSTETRICS AND GYNECOLOGY.

New York, September 13-17, 1915.

The Seventh International Congress for Obstetrics and Gynecology will convene in New York City, U. S. A., on September 13, 1915, and the Scientific Session will be held on September 14, 15, 16 and 17, 1915.

There will be one scientific session each day from 9 to 1 and the afternoons will be devoted to clinics, etc.

The following is an outline of the scientific program:

1st theme: The Remote Results of Operations for the Relief of Retrodisplacements of the Uterus, Both Simple and Complicated. Reporter, Prof. Th. H. Van der Velde, Haarlem, Holland.

2d theme: The Treatment of Puerperal Infections. Reporter, Dr. Edward P. Davis, Philadelphia, Pa., U. S. A.

A prominent feature of the program will be: The Value of Radioactivity in Gynecological Therapeutics; 1st, Roentgen Ray; 2d, Radium; 3d, Mesothorium. This may be discussed in individual papers or in the form of reports.

Friday, September 17th: Miscellaneous Papers.

National societies are encouraged to discuss these subjects at least eight months before the meeting of the Congress, and to have reporters collect and digest the discussions and report their conclusions.

tached at the other, if turned out into muscle, *re-produce* regularly bone on their under surface.

3. "Bone transplanted without the periosteum into muscle or cellular tissue *always dies* and is ultimately absorbed.

4. "The graft is *per se* not osteogenic but osteoconductive."

In 1913, Murphy⁵ seemed to have changed his views, as follows:

1. "Normal periosteum completely detached from bone and transplanted into a muscle tissue bed in the same individual, if he be young, may produce a permanent bone deposit, *but only if osteoblasts remain attached to the lower layer of the periosteum. The periosteum of itself is not osteogenic; it is rather a limiting membrane.*"

2. Statement 2 of 1912 is modified by adding, "But not unless there are osteoblasts attached to it."

Macewen, the pioneer of new thought in this field, states:

1. "The periosteum has no osteogenic function."

2. "Where bone is said to have been reproduced from periosteum bone plaques must have been raised with the periosteum."

3. "It has been shown that the bone from the diaphysis can be transplanted in bulk and that it grows without the intervention of periosteum."

Albee, of New York, has recently added confirmatory evidence of part of Macewen's work. In his summary he tells us that "it seems to be largely a question of definition of what the periosteum is and what it includes as to whether it is osteogenic or not." Let us, then, turn our attention for a few moments to this question.

We find two definitions of periosteum. According to one, periosteum is made up of three layers: (1) an outer fibrous layer possessing blood-vessels, (2) an inner fibro-elastic layer made up of elastic fibers and containing lymph spaces, (3) an osteogenic layer. According to the other definition, periosteum is a fibrous membrane composed of two layers, the inner of which contains many elastic fibers and blood-vessels. Beside these two recognized layers, however, there is a quantity of loose areolar tissue existing between the inner of the two layers and the bone. It is sufficiently loose to permit of easy penetration by the osteoblasts from the underlying osseous tissue. In healthy adult life the subperiosteal areolar space contains few or no osteoblasts.

As a result of such divergent views concerning the nature of the periosteum have arisen the present-day theories concerning the function of the

periosteum. As we have seen, the majority of observers believe with Ollier that periosteum is the chief regenerator of bone.

Macewen's view is as follows:

1. The periosteum aids in the nutrition of bone because of its abundant blood supply which is distributed through the haversian canals to the bone.

2. The periosteum is a limiting membrane.

3. Since it contains no osteoblasts, no osteoblastic reproduction can ensue from periosteum which is detached from the bone.

4. In cases where bone is said to have been produced from transplanted periosteum, bone plaques must have been raised from the bone in process of removal of the periosteum, and have been transferred along with it.

Believing, as I do, as a result of experimental data, the latter theory of the function of the periosteum, there must be found a suitable explanation of

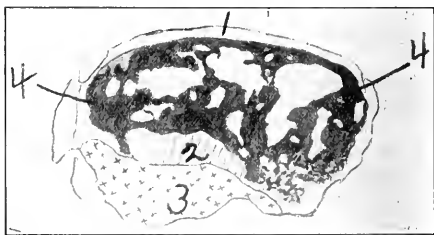


Fig. 1. Section from periosteum-free bone transplant into rectus muscle. Low power. (1) Newly formed connective tissue envelope, i. e., new periosteum. (2) Rapidly growing periosteum. (3) Granulomatous connective tissue. (4) The black areas are bone.

the regeneration of bone through the agency of the osteoblast, the embryonic bone cell

1. Primary ossification proceeds through cartilage; in fact, the osteoblast is the result of division and liberation of the nuclei of cartilage cells.

2. Primary periosteum is a connective tissue tube in which the centers of ossification are laid down. Without the deposition of such centers of ossification, bone is not formed and there is then any one of the possible congenital anomalies due to the absence of a part (acheiria).

3. Bone is living tissue, and as such must undergo a constant process of renewal and repair. Such changes can only occur, according to Macewen, as follows:

4. Following stimuli to bone, the cells on the interior proliferate, and escape through the Haversian canals into the subperiosteal space; there they find room for proliferation and may ultimately contribute to the breadth of the shaft.

With this brief and incomplete review of the

Further, the periosteum showed less vitality than the bone transplants in the experiment on the eye, because we noted that the periosteum had been absorbed and the bone had grown.

Is periosteum necessary for bone growth? That it is not seems clearly proven by the results of experiments dealing with Question 1. To satisfy ourselves further we removed the periosteum entirely from the shaft of growing bones, compared the two after six weeks, and found no difference in their diameters. Further, we fractured both tibiae in the same animal; on one side the periosteum had been previously stripped from the shaft above and below the proposed site of fracture; on the other side the periosteum was not removed. Callus was formed in large amounts, giving a perfect union on both sides.

When periosteum was elevated from the shaft, in some instance nodules appeared on the cortex from which the periosteum had been removed.

We see, then from these experiments that periosteum is not essential for bone growth and that it acts as a limiting membrane.

These last two facts are of great importance in respect to the future ideas governing the repair of fractures.

CONCLUSIONS.

1. We believe that small bony transplants are osteogenetic and not essentially osteoconductive.
2. Periosteum has no osteogenetic function, but is rather a limiting membrane.
3. Periosteum is not essential to the repair of defects in bone.

I wish at this time to acknowledge my indebtedness to Prof. Mann for the courtesies he has shown me. Had it not been for his willingness to assist me in this work I should have had to abandon it. During the entire time he has manifested marked interest in all details of the work.

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DUODENAL ULCER.

The results following gastro-enterostomy for duodenal ulcer are very good. But a small percentage of cases may not be cured by this procedure and in these the excision of the ulcer with a plastic operation on the outlet of the stomach, while giving a slightly higher primary mortality, will yield a higher percentage of permanent cures.—W. J. Mayo in *The Lancet-Clinic*.

PYELOTOMY VS. NEPHROTOMY IN NEPHROLITHIASIS.

RALPH DUFFY, A.B., M.D.,
TAMPA, FLORIDA.

The object of this paper is to discuss the advantages and disadvantages of incision of the kidney parenchyma and pelvis, respectively, for the relief of stone—a matter about which great difference of opinion exists among the foremost operators.

Henry Morris,¹ in 1880, was the first to open an otherwise healthy kidney for the relief of stone. He incised the parenchyma. Following the lead of this great teacher, nephrotomy for stone has always been the popular operation among English-speaking surgeons. It is remarkable that Czerny as far back as 1880 advocated incision of the kidney pelvis, but up to within very recent times his views and those of his followers have been unpopular. However, there has been in the last few years considerable tendency for the pendulum to swing the other way.

I have always practiced nephrotomy in the removal of renal calculus, fearing fistula from pyelotomy, but an extremely grave hemorrhage in an otherwise simple case led me some time ago to modify my views to some extent. In that case, following the removal of a simple stone from an infected kidney, the wound in the kidney being closed with a tube drain, hemorrhage occurred on the fourth day and resisted all attempts at packing the wound. Nephrotomy was finally done on the sixth day when the patient was almost exsanguinated. On examining the kidney removed, all the sutures had held, and as far as could be determined the bleeding came from the eroded drainage tract. However, as this tract had been tightly packed to stop the hemorrhage, its raw appearance may have been due to this manipulation.

ADVANTAGES OF NEPHROTOMY.

In the first place, nephrotomy can be done without dislocating the kidney out of the wound. Hence in the case of a short pedicle, or of adhesions binding the kidney down, it is obligatory. Israel² considers pyelotomy of but limited application because it is generally not possible to deliver the kidney out of the wound, and as he considers essential, for the proper opening of the pelvis and the later care of the wound. Kummel³ also declared that large stones and those in the parenchyma of the kidney could not be removed by pyelotomy.

All of the earlier writers accused pyelotomy of the formation of permanent fistulae.

When suppuration exists and drainage is neces-

save nephrotomy is certainly to be preferred. It would seem to me that the main indications for nephrotomy are suppurative conditions of the kidney, inability to deliver the organ into the wound, and a branched condition of the pelvis with the stone in the primary branches, that is, high in the kidney substance.

DE WYANENDE VAN DE NEPHROTOMIE.

The great objection to nephrotomy is hemorrhage. This may come on at operation, or within twenty-four hours, or be deferred as long as three weeks following operation. It may be slight or fatal. Various causes have been assigned for this complication. It is said to occur quite as frequently in small incisions as in large. Mueller¹ considers arteriosclerosis the main factor. Neuhaeuser² believes that the hemorrhage is due to distension of the pelvis and separation of the cut surfaces due to blocking of the ureter by a clot. Eisendrath³ thinks that pressure of drainage material is the cause, but this would not explain hemorrhage in non-drainage cases. Belfield⁴ considers hemorrhage to be always due to faulty technic.

That severe hemorrhage following nephrolithotomy is by no means a rare complication is clear from the reports from the various clinics. Neuhaeuser² from Israel's clinic reports nine per cent of serious hemorrhage following nephrotomy with several deaths. Fleischer,⁵ from Casper's clinic, reports three cases of hemorrhage with one death. Zuckerkancl⁶ reports two cases with one death. Baum⁷ reports four cases with one death. Makias⁸ reports nineteen cases. Krotoszyner,⁹ Bevan,¹⁰ and Jacobson¹¹ report fatalities also. There must be many fatalities from this source which never appear in the literature.

At the time of operation, the hemorrhage can be controlled by pressure on the pelvis, either with a special clamp or by the fingers of the assistant. Approximation of the cut surface by rough and through sutures of catgut are our chance after operation. Lower,¹² of Cleveland, claims to prevent post-operative hemorrhage by ligating the spurring vessel on the cut surface with fine chromic catgut. I have tried to do this, but gave it up as futile.

The line of incision used in the operation is the one suggested by McRossell,¹³ just posterior to the convex border of the rib cage. The incision, though this line is only parallel to the posterior surface of the kidney and not the flattened area between anterior and posterior arterial trees. Zondek¹⁴ advocated practically the same incision. Miller¹⁵ and Derge¹⁶ advised dividing the kidney with other

wire, and lower¹² the same incision and our formation are followed by others. However, these observations were made in 1905, and the same reasoning would not necessarily hold for kidneys rendered fibrous by disease. In these sections of the kidney will always carry the greatest danger of hemorrhage, and it should not be forgotten in these days of perfected radiography.

PYCLOTOMY.

The last three years has shown a marked trend of favor toward pycotomy for renal calculus. Eisendrath,¹⁷ Bazy,¹⁸ Casper,¹⁹ Baum,⁷ Lower,¹² Giblin,²⁰ Schenker,²¹ Krotoszyner,⁹ and Cabot²² are all recent advocates of pycotomy.

It must be granted that pycotomy cannot always be practised. In the first place, the kidney cannot always be delivered well up into the wound. To increase the ease of delivery, the twelfth rib may be excised. W. J. Mayo²³ advises the free exposure of the twelfth rib and the division of the quadratus and the lateral arcuate ligament which binds the rib to the transverse process of the first lumbar vertebra. He says this gives excellent exposure and obviates the necessity for rib resection. The dissection must be made with caution to avoid injury to the pleura.

Again, the type of pelvis best adapted to pycotomy, the ampullary or sac-like, may not be present, but the pelvis may be branched, either bifid or trifid, and the stone may be lodged in one of the branches. Eisendrath³ finds the pelvis branched in twenty per cent of the cases. A branched pelvis is not on the whole suitable for incision for exploratory purposes. Indeed, incision of the pelvis for exploration for stones is of doubtful benefit in any case. For in my experience one can feel as much by holding the kidney in one hand and hooking the index finger of the other in the kidney notch with the pelvis intact.

With proper manipulation quite large stones can be removed through the incision in the pelvis. Gure reports the removal of a stone weighing 13 grams.

As to the manner in which the incision is to be made, the pelvis with two or three, and a single large diverticulum, or even a single diverticulum, and a tubular pelvis, the latter, if the stone is in the pelvis and the diverticulum is small, may be closed by the simple closure of the mass of plicae. W. J. Mayo²³ has shown how this may be carefully done, although the stone may be considered to be beyond the reach of the incision. In the case of a branched operation, the stone may be removed, but not reach the ureter, and the stone may be left in the ureter, or the stone may be removed.

Hemorrhage is not marked in pyelotomy as a rule, but it may occur. Writers of experience counsel gentle manipulation in delivering the stone lest marked bleeding follow. The bleeding seems to come from the stone tearing through the eroded pelvic wall into the surrounding venous plexus (Eisendrath¹⁸).

Fistulae following pyelotomy, formerly so feared, seem latterly to be much less frequent. The fatty layer covering the pelvis should be replaced. Payr¹⁶ advises fortifying the incision with a flap of the fibrous capsule of the kidney. The ureter should always be catheterized to insure that it is patent.

In conclusion, from a review of my own experiences and those of others I am convinced that pyelotomy is destined to win more and more over nephrotomy on the basis of its merits as a simpler and safer operation.

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NYSTAGMUS AND CEREBELLAR DISEASE.

Nystagmus is an irritative motor cerebellar phenomenon, since it may be produced in monkeys by irritation of the nuclei of the cerebellum. Cerebellar nystagmus is usually manifest on turning the eyes towards the diseased side. Patients with cerebellar disease lie as a rule on the diseased side, because they cannot then turn the head toward that side and thereby the nystagmus, dizziness, and vomiting are lessened. The localizing value of this symptom must not be placed too high.—S. P. KRAMER in *The Lancet-Clinic*.

SUSPENSION LARYNGOSCOPY IN AMBULATORY PATIENTS.

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Although it is but little more than two years since Killian published his epoch-marking suspension laryngoscopy, many men have turned their attention to this new procedure in the examination of the larynx. In my opinion it is to be regarded as an improvement in the technic of direct laryngoscopy as introduced by Kirstein, rather than as a new method of laryngeal examination. In the older method the handle of the speculum is held and steadied by the operator. This requires often great muscular effort and is very fatiguing, especially while operating through the speculum. In suspension laryngoscopy the speculum is self-retaining and is supported by an adjustable mechanism.

To review briefly the apparatus and its method of employment: It consists of two portions, the direct speculum and the suspension apparatus. The direct speculum is made up of a hook-shaped handle, at the lower end of which there is fastened a grooved spatula, V-shaped on cross section with its distal end bent slightly upward, flattened out and broader than the rest of the spatula.* It is fastened to the handle at a little less than a right angle. The spatulae are interchangeable and of different sizes for adults and for children, for males and for females. Later forms of spatulae in which there are movable central blades to raise and hold the epiglottis after the introduction of the spatula into the mouth and its adjustment on the tongue, have been devised by Albrecht. I have not met with any difficulties in the use of the original Killian spatula, and in fact the new form somewhat limits the field of vision and interferes in operative work.

At the lower end of the handle there is a mouth-gag and an adjustable tooth plate which serve to hold open the mouth and to preserve the proper relations between the instrument and the head of the patient.

The handle itself is 32 cm. long, curved slightly forward at its upper end and bent into a hook whereby the instrument is suspended from the crane. The original rigid handle of Killian has been modified by Albrecht and again by Killian himself, their object being to bring the point of

*The speculum and the hook have undergone a number of modifications which in my opinion serve to complicate the technic and to make the procedure more painful and uncomfortable for the patient without materially increasing the size of the field of operation or rendering it more easy of approach.

growths of the cords, such as papillomata, were removed. Cases of stubborn chronic laryngitis behaved well under suspension treatment. The applications can be made more directly to the lesions, and small amounts of strong solutions can be applied with more benefit than with the methods commonly in vogue.

After resting for a short while the patients are allowed to go home. In no cases were there any untoward results. There was no difficulty in breathing or in swallowing and only occasionally did a patient complain of a sore throat or of a sore tongue. Several patients complained of slight stiffness of the neck and pain for a few days after the procedure.

The more extensive operations, those requiring general anesthesia or where there is a likelihood of the patient's being suspended for some time, are not ambulatory cases. These patients are sent into the hospital and their treatment and the results therefrom do not come within the scope of this paper.

In none of the ambulatory patients is the suspended position maintained for more than five or ten minutes. It must be remembered that these patients have been given no morphine and that they are fully conscious. They approach the procedure without a narcotic, and it is worthy of note that almost invariably they are willing to submit to further suspension. When one considers the class of patients one sees in the average out-patient department, their comparatively low average of intelligence, their often high-strung nervous organization, and their great fear of pain, it is evident that only a slight amount of pain or even of discomfort is caused by this method.

The results of our work in this field have shown us that suspension laryngoscopy is capable of a wider range of usefulness than it has hitherto developed, that it can be done on ambulatory patients for examination and minor operations under local anesthesia without having previously narcotized the patient with morphine, and that in adults at least it is an entirely justifiable procedure.

616 MADISON AVENUE.

CECAL TUMORS.

The tumor formation of both malignant and tubercular ceca are very apt to be mistaken for appendic abscesses. Sometimes, indeed, the malignant disease may have engrafted on to it some pus formation. A diagnosis of appendicitis in the aged should always be attended by a grave prognosis.—R. E. KELLEY in *The Medical Press and Circular*.

STRAIGHT DIRECT LARYNGOSCOPY, BRONCHOSCOPY AND ESOPHAGOSCOPY.

RICHARD HALL JOHNSTON, M.D.,

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BALTIMORE, Md.

(Continued from October Number.)

Some general remarks on the extraction of foreign bodies. The subject of the removal of foreign bodies from the trachea and bronchi is of such importance that a few general remarks will not be amiss, though the writer may be accused of repetition. In the beginning it may be said that when a foreign body is known to be present or is supposed from the symptoms, the sooner one operates the better. To wait even a short time for the patient to expel by coughing is dangerous and uncertain. Especially with such objects as beans and grains of corn is delay fraught with the most serious consequences, for, each minute, they are swelling, and if impacted in a bronchus, they will finally cut off all air to the lung, which will collapse. Then, in the effort at removal if the body should be dislodged and slip into the bronchus of the sound side, sudden death would result because of the complete collapse of the other lung. These cases are extreme, but, in view of the fact that beans are always difficult to extract, one cannot be too careful in their attempted removal. Cases of sudden death in children after the introduction of the bronchoscope, in which the only symptoms noted were stoppage of respiration and cyanosis, were probably due to the above cause. Statistics show that only 20.5 per cent. of all foreign bodies are expelled spontaneously. Kahler, who collected data from bronchoscopists throughout the world, shows that in 291 foreign bodies treated in 1910-1911, only thirteen (4.5 per cent.) were unsuccessful, which is a great triumph for the bronchoscope. In no branch of medicine do fixed rules or methods enter less into operation than in the removal of foreign bodies. The skill of the operator, his personal ingenuity, and the knack of making instruments to fulfill the requirements in cases out of the ordinary are of greater importance than rules of procedure. In certain cases the removal of the foreign body must be preceded with, though pneumonia be present, for the only hope for the patient lies in successful operation. It is remarkable how quickly the disease clears up after the removal of the ob-

the pin is small, but will not work with large pins; on one blade of the forceps is a groove in which the body of the pin fits, while on the other blade is a small hook into which fits the open point. When one succeeds in getting the point into the hook, the blades are closed so that the pin is rendered harmless and can be extracted without difficulty. The writer feels that in the present advanced stage of bronchoscopy, certain external operations such as thoracotomy, bronchotomy, and pneumo-bronchotomy do not need to be considered in a book of this character. He is convinced that the great majority of foreign bodies can be successfully removed with the aid of the tubes, and in the few exceptional cases in which bronchoscopy fails, it is not likely that the patient can be helped by these cutting operations.

CHAPTER VII.

ESOPHAGOSCOPY.

Historical. The history of esophagoscopy shows that it is much older than direct laryngoscopy and bronchoscopy, and that the first successful attempts to pass an esophagoscope were due to the skill of laryngologists. This would seem to prove that those who are most familiar with the anatomy of the larynx and the upper end of the esophagus are best qualified to do such work. That the laryngologist by the constant manipulation of instruments in the larynx can do esophagoscopy best, there can be no doubt, though some profess to believe that the esophagus should be given to the stomach specialist. In 1870, Waldenburg succeeded in introducing a tubular mirror, 14 centimeters long, into the upper end of the esophagus and diagnosed a diverticulum. Two years before Semeleder and Stork had made unsuccessful attempts to see into the esophagus. Shortly after Waldenburg's experiments, Stork passed a long, straight tube into the esophagus and examined the entire organ for the first time. Some twelve years later, Mackenzie and Lowe tried unsuccessfully to get a view of the upper end of the esophagus with a skeleton esophagoscope, which ended in the pharynx. The Leiter-Nietze instrument was constructed with a series of prisms and an internal lamp. Experiments by Kussmaul and later by Mueller proved that a straight tube, 13 millimeters in diameter, could be passed into the esophagus of a normal individual; for illumination they used Desormeaux's apparatus. Kussmaul wrote no articles on his work and it would have passed into oblivion had it not been for Killian. In 1881, von Mienicz began to experiment with tubes at the instance of Leiter, who was a noted instrument maker in Vienna, and who was

familiar with Kussmaul's work in 1868. Miculicz had seen Stork use the esophagoscope and he combined the straight tube, originated by Stork with Leiter's illuminating apparatus, which consisted of an interior lamp of platinum wire with water cooling. To him must be given the credit of the first generally useful esophagoscope with which he examined the esophagus pathologically, physiologically, and anatomically. No one seems to have done anything worthy of mention with the esophagoscope after Miculicz until a number of years later, near the close of the last century. With modern esophagoscopy the names of Starck, Gottstein, Rosenheim, Kirstein, Killian, Brunings, and Guisez, in Europe, and Jackson, Mosher, Halstead, and others, in America, are linked. Jackson probably deserves more credit for the progress of esophagoscopy in this country than any other one man. His laryngoscopes are certainly among the best for the examination of the upper end of the esophagus, which ought always be done before passing the tube further down. The writer still uses Jackson's instruments as being the handiest he has seen. For some purposes a 12-millimeter tube is desirable, but for all average cases, the 10-millimeter tube answers all requirements. With it one can detect diverticula by working carefully, and this is probably the most difficult lesion to diagnose.

Methods of examining the esophagus. The writer will describe the different methods of examining the esophagus and will then refer to the straight method, which he has used for some time. A fair comparison of the methods will be made and the advantages of the straight method in examining the upper end of the esophagus will be pointed out.

The most important and the most difficult point in esophagoscopy is the examination of the upper end of the esophagus. At the level of the cricoid cartilage or the clavicle, foreign bodies usually lodge because these points are the narrowest in the esophagus; in children strictures will often be found here for the same reason. It is therefore very important to have some simple means of exposing these areas so that careful visual inspection will prevent possible injury to the walls, in the case of a tight stricture or a sharp foreign body, from pushing the esophagoscope down into the esophagus. With a long tube it is not possible to see the upper end of the esophagus. This is shown by the reports of skilled operators who have passed the long tube over a foreign body situated at the cricoid cartilage, and have made a prolonged and unnecessary search before finding it. While not de-

to pull the cricoid cartilage forward and to expose the upper end of the esophagus. The only objection to the instrument is that the light is not bright enough to see far down. The DeZeng Company now has under process of construction a tube similar in shape to the modified speculum which will have their brilliant light at the end of it. With it one will be able to see far down in the esophagus or to the bifurcation of the trachea. Jackson's method differs from the above in that the head is further extended, since his large separable speculum is used. In his description the instrument is introduced between the incisor instead of the bicuspid teeth. In passing the large tube between the incisor teeth, it seemed to the writer that the patients complained more than was necessary for such a simple procedure. The outcome of this was the modified position of the head and the use of the smaller tube between the bicuspid teeth. After the examination of the upper end, if one wishes to explore the esophagus to the cardia, the large separable speculum is passed between the bicuspid teeth to the pyriform sinus. The 10-millimeter esophagoscope is then passed through the speculum, and when it reaches the sinus the cricoid cartilage is pulled forward and slight pressure on the esophagoscope coaxes it into the esophagus with a certain "give" as it passes the cartilage which is unmistakable. An assistant steadies the esophagoscope while the operator removes the speculum. Then, under the guidance of the eye, the esophagoscope is pushed further down and the walls of the esophagus examined. Certain operators advise larger tubes, but the writer has not found them absolutely necessary, and one is sure that with the 10-millimeter instrument no harm can be done if it is handled gently. The walls of the esophagus are thin and there is some danger of tearing them with the large tubes recommended by some operators. The writer has discarded the large separable speculum except as an aid in passing the large esophagoscope under local and general anesthesia. Practically all examinations of the esophagus at the Presbyterian Hospital are made under local anesthesia, and the method described above has been found very satisfactory.

The examination of adults under general anesthesia is made by Jackson with the head in the "Boyce position," which has been described above. With the head and shoulders over the end of the table and held by an assistant, the operator passes the separable speculum with the left hand and pushes it down behind the cricoid cartilage which is lifted by pulling on the instrument. The upper end of

the esophagus is thus exposed. In passing the esophagoscope Jackson uses the left index finger which is pushed down to the pyriform sinus or as far down as possible, as a guide, and slides the tube alongside of it until the instrument is in the sinus, when the larynx and the base of the tongue are forcibly lifted with the finger and the tube directed into the esophagus. This is a good method when one has long fingers, but with fingers as short as the writer's, it is almost impossible of accomplishment. Mosher sometimes uses very large esophagoscopes and claims that they make diagnosis and operative procedures easier. Occasionally the writer has passed the esophagoscope under local anesthesia with the patient in the prone position. The same method was used as in the sitting position, with the head over the end of the table. Brunings uses in the sitting position the same position of the patient as in direct laryngoscopy. He states that there has been much discussion as to whether examination can be better effected with the patient lying on his back or on his side. He gives the preference generally to lying on the left side. The dorsal position is especially indicated if the tube is to be introduced into the stomach. He speaks of the two methods of introducing the tube; in the "introduction by feel" a bougie is passed through the esophagoscope and the instrument is allowed to slip along the posterior pharyngeal wall near the middle line. If the end should stray into the sinus pyriformis in consequence of lateral deviation, it readily retains the middle line when the patient is told to swallow. It is possible to judge when the bougie has passed the entrance to the esophagus either by the sudden cessation of resistance or by the fact that the spatula tube almost disappears into the mouth. When this passage is accomplished, the second or straight act can take place. The patient bends his head further back, the tube is placed upright in a gap between the teeth, if such exists, or if the upper jaw is very prominent, into a corner of the mouth, the head being rotated to the other side. The surgeon rotates the tube gently, at the same time maintaining a moderate but steady downward pressure, and can feel a perceptible jerk when the sloping end of the tube overcomes any resistance. In the great majority of cases, by following these directions, even a beginner has no difficulty in introduction. A practiced hand can do it almost mechanically, and when he knows his bearings can use a little extra pressure, as lesions are seldom caused by a well-fitting mandrin. The tube spatula keeps in position, of itself, as soon as the lower end is 4 to 5 centimeters past

left hand and passes it between the bicuspid teeth, pushing it rapidly down behind the larynx. When the tube is well down the cricoid cartilage is forcibly pulled up, exposing the upper end of the esophagus. The procedure is easy, but is not often resorted to because nearly all patients are successfully examined in the sitting position under local anesthesia. The small speculum is long enough to insert into the upper end of the esophagus if necessary. If, after examining the upper end, it is desired to explore the esophagus proper, the cushion under the head is removed and the head allowed to fall to the plane of the table. The large separable speculum is now passed between the left bicuspid teeth and pushed rapidly down until the left pyriform sinus comes into view. In this maneuver the operator stands to the left and holds the instrument in the left hand. When the sinus is seen, the 10-millimeter esophagoscope is passed through the speculum and at the instant that the larynx is pulled up with the short tube, the long tube is gently pushed into the esophagus. The separable speculum is then removed, the operator takes his seat at the end of the table and proceeds with the examination under the guidance of the eye. If the right thickness of the cushions has been chosen, very little movement of the head is necessary to explore the esophagus. As in tracheo-bronchoscopy one is surprised how little extension of the head is needed for successful work.

The examination of the upper end of the esophagus in children is very simple. As in direct laryngoscopy no anesthetic is used. The little patient is wrapped in a sheet which is so pinned that the arms and legs are practically immovable. The head lies straight on the table and is held by an assistant who is entirely out of the way of the operator, who stands to the left of the table and passes the small tube with the left hand between the incisor or bicuspid teeth and pushes it down back of the larynx with little force. The cricoid cartilage is now raised by pulling slightly on the laryngoscope and the upper end of the esophagus exposed. Strictures and foreign bodies are easily and quickly diagnosed and treatment carried out in the same position. If it is necessary to examine the esophagus further down, the small separable speculum is passed in the middle line, the 7-millimeter esophagoscope pushed down through it, the speculum removed and the esophagus easily examined with the head slightly extended. The operator manipulates the instruments from the left side of the table. The ease with which the upper end of the esophagus is examined with the head straight is really remarkable. In a few seconds the diagnosis is made and

the child is unharmed. Sometimes with a struggling child, an abrasion of the membrane occurs, but this also happens under general anesthesia occasionally. It is by far the simplest method of examining children. The writer extracts all foreign bodies with the head in this position and its advantages will be clearly shown under this heading.

Another method of examining the upper end of the esophagus in children is to pass the tubes with the head in the "Boyce position," but it is so much more difficult than the straight position that the writer simply mentions it by way of comparison. Mosher's method is valuable in certain cases, but it is hardly necessary to go through such a complicated procedure when the straight method is so much easier. For these examinations of the upper end of the esophagus, no instrument is equal to the modified Jackson laryngoscope, which is large enough to see and to work through. In the opinion of the writer the electroscope of Brunings is less valuable because the visual field is not as large.

After the esophagoscope passes the narrow upper end of the esophagus, the remainder of the examination is usually easy. The upper part of the esophagus—the so-called cervical portion—is transverse in character with its walls in contact for about three inches and this part can be clearly distinguished from the so-called dorsal portion which is oval in shape and appears open to the esophagoscope so that one can see some distance down into the esophagus through it. Just as soon as the cervical part is passed, the mucus membrane is no longer pushed aside by the advancing tube, but the esophagus itself opens up as if to receive the instrument. At each inspiration the esophagus widens and in ordinary examinations it is always well to have the patient take deep inspirations. At the bifurcation of the bronchi, there is a slight constriction which is easily passed; in the region of the aorta, its pulsations are recognized, and often are communicated to the tube. Just below these constrictions the instrument passes into a wide lumen which gradually curves to the opening through the diaphragm. In this region it is well to have the esophagoscope in the right side of the mouth so that by pressing the end to the left, the curve of the esophagus can be easily followed and the tube prevented from catching against the right wall of the lumen, which would happen if the instrument were pushed down straight. The diaphragmatic contraction is usually represented by a narrow cleft which runs from the left side anterior to the right side posterior. In some patients the opening is shaped more like a rosette. Passing the diaphragm is probably the most difficult part of

ditions will be taken up later. Spasmodic conditions of the esophagus will often require the introduction of the esophagoscope both for diagnosis and treatment.

Contraindications for esophagoscopy. These are the same as for tracheo-bronchoscopy, viz., advanced heart disease, arteriosclerosis if in an advanced stage, and extreme weakness. In cases of total obstruction the writer does not allow great weakness to deter him from passing the esophagoscope for the purpose of dilating the stricture. In aneurysm, esophagoscopy must be done with great care, and in most cases it is better to dispense with the examination unless the patient is completely stopped up.

Dangers of esophagoscopy. These have been emphasized above; the writer does not consider esophagoscopy dangerous in the hands of a careful operator. The most dangerous points in the esophagus are the upper end and the opening through the diaphragm and careful manipulation of the tube practically removes the danger of rupture at these points. As has been emphasized above, the greatest danger is in the rough or hasty manipulation of the tube. In all tube work one must see what he is doing; the tube must not be advanced until one is convinced that he has a clear field before him. In curvature of the spine it may be impossible to pass the tube; if one succeeds he must work very carefully in introducing the instrument.

CHAPTER VIII.

DISEASES AMENABLE TO TREATMENT THROUGH THE ESOPHAGOSCOPE.

Acute esophagitis. The esophagoscope should never be passed in acute esophagitis unless one knows that a foreign body is present or is suspicious that such is the case, for instrumentations will only make the inflammatory condition worse. One who has seen the worst type of esophageal inflammation with the intense suffering to the patient will hesitate to add to the distress unless it is absolutely necessary. In the removal of foreign bodies the esophagoscope has given the opportunity to study the changes in acute esophagitis. Some years ago a lady was brought to the writer with the history of having swallowed a large oyster. She had fever and pain on swallowing and was prostrated. Since no food would go down, she was examined under ether to find out if the oyster was sticking in the upper end of the esophagus. Jackson's separable speculum was passed and the upper end of the esophagus exposed; the mucus membrane was enormously swollen, reddened, and edematous, and in place streaked with blood. The

oyster had evidently passed down; the esophagus had probably been scratched by a piece of shell which had set up the severe inflammation. Treatment was practically confined to the use of ice internally and externally, with hypodermic injections of morphine to relieve pain, which was intense. For several days the efforts to swallow were agonizing and it looked as if the patient would starve. Emaciation was extreme. When her condition seemed critical, some improvement in swallowing was noted and the pain disappeared rapidly. The patient immediately began to increase in weight and in about two weeks was able to return to her home in South Carolina. Such a condition can be brought about in foreign body cases by the careless use of forceps and bougies, and the membrane may be so torn that a fatal issue is the result even after the object is removed. Acute inflammation by its swelling greatly increases the difficulties of removing foreign bodies. The writer has seen several cases of slight acute esophagitis from swallowing small bones. The changes in the membrane are not marked; there is usually increased redness with or without some swelling. The chief complaint of the patient is a painful or sticking sensation in the upper part of the esophagus which may or may not radiate to the back. Such cases always yield to ice applications and cold milk as diet. The writer has seen the scratch in the membrane on two occasions. In his earlier experience he was inclined to subject these patients to an examination; of late years, if the pain is not severe and the temperature is not elevated, he contents himself with attempts to find out from the patient the size of the bone, and, if it is small, he does not make an examination in the beginning. If the symptoms grow worse, which is seldom the case, the esophagoscope is passed to be sure that the foreign body is not present.

Strictures of the esophagus. The safest and best treatment of strictures is through the esophagoscope. The old method, which is still persisted in by some, of forcing stiff bougies through a stricture, is a dangerous one, because often the stricture is so dense that the bougie can easily slip away from it to the esophageal wall, and undue force here is liable to perforate with fatal mediastinitis as the result. In some cases there are a series—two or more strictures—and, if, perchance, the stiff instrument passes through the first one safely, there is still another chance for perforation. There is no way of estimating how many deaths have been caused from the blind use of bougies. Now that esophagoscopy is so safe and so sure in the treatment of benign strictures, it does look as if the

J. C. Bloodgood, who referred him to the writer for treatment. Under ether anesthesia the 7-millimeter esophagoscope was passed and the stricture located two inches above the cardia. There was no narrowing at the upper end of the esophagus. The stricture was quickly dilated and a small, soft bougie was passed immediately. The little patient had a rather severe reaction, but made a good recovery, and in two weeks was allowed to go to his home in West Virginia to be under the care of his uncle, who is a physician.

An interesting case which shows how little esophagoscopy is known, or, if known, how little appreciated by the general surgeon, was that of a boy, 10 years old, who swallowed lye when he was 19 months old. A stricture formed and he was placed in the hands of a general surgeon, who passed bougies for years. When the writer saw the boy three years ago, he had never swallowed solid food, having lived all his life on milk and strained soups. If, perchance, a small piece of bread or rice happened to reach the esophagus, there was immediately a spasm, which sometimes brought on convulsions, and a hypodermatic injection of morphine would have to be given to put him to sleep, after which he would be ready to drink again. He was a source of great care to his mother, who had to strain his food carefully. He was not allowed to go to picnics with his little playmates because he could not eat. Under ether anesthesia the 7-millimeter esophagoscope was passed and the stricture located above the cardia. It was successfully dilated and in a short time the boy was eating everything. The writer was interested to see how his stomach would act after so long a diet of liquids; from the first he had no trouble with his digestion. Many things which he had craved during his enforced fast were distasteful to him when he tasted them. With the passage of the bougie every few months, which he does himself, he has remained well. In the experience of the writer corrosive strictures are more frequent near the cardia than at the upper end of the esophagus, which differs from the observations of some other men. It looks as if strictures at the upper end of the esophagus ought to be more common since this is the narrowest part of the lumen, and the escharotic can exert its full effect here.

Tubercular strictures. The writer has seen one case of this rare condition and it happened to be the first stricture in his experience. The patient was a male, 44 years old, an ex-prize fighter, who came to the Presbyterian Hospital complaining of difficulty in swallowing solid food. Examination

with the 10-millimeter esophagoscope revealed a large ulcerating mass 8 inches from the upper teeth which looked like a malignant growth. Since the patient had been a hard drinker for years, and no signs of syphilis could be found, a diagnosis of malignancy was made. The stricture was dilated from time to time and the patient was made comfortable for six months, at the end of which time he died. A month before his death he developed numerous râles over both lungs. At the autopsy the diseased portion of the esophagus was removed for more careful examination. The patient died of an acute miliary tuberculosis. Microscopic sections from the esophagus showed that the tumor was tubercular and not malignant. Specimens removed through the esophagoscope would have made the diagnosis much earlier. This case teaches that one can never be certain of diagnosis through the esophagoscope, and it is always better to remove specimens for microscopic examination.

Syphilitic strictures. Syphilitic lesions in the esophagus are rarely seen. Some observers go so far as to say that they never occur. Some years ago a colored woman, 25 years old, came to the dispensary of the Presbyterian Hospital complaining of difficulty in swallowing. After local anesthesia she was examined with the large separable speculum. Just below the cricoid cartilage a large, reddish, granular mass, resembling an ulcerative epithelioma, was seen. Since the patient was only 25 years old and had had her trouble a comparatively short time, a probable diagnosis of gumma was made. The diagnosis was rendered more probable by the unmistakable signs of syphilis in other parts of the body. The patient was given increasing doses of iodide of potash and the tumor gradually disappeared. The patient was watched for some time after the gumma had healed and except for a slight narrowing of the esophagus which did not interfere with swallowing there were no bad results.

Malignant strictures of the esophagus. Cancer of the esophagus forms one of the darkest chapters in the history of medicine. Until the introduction of the esophagoscope, such cases were treated by making a hole in the stomach for sustaining life as long as possible. Thanks to the tube it is now possible to dilate such strictures and to give the patient the pleasure of tasting what he eats. Some authorities are opposed to the dilatation of malignant strictures, claiming that the growth of the cancer is thereby stimulated and death hastened. If one watches such a patient throughout his illness, as the writer has repeatedly done, it will not

esophagismus which is much more serious because in many cases treatment seems to do little or no good and the patient is reduced to extreme weakness from lack of nourishment. The diagnosis is made by passing the esophagoscope under deep general anesthesia, which relaxes the spasm and allows the tube to slip easily into the stomach. The condition simulates an organic stricture in that soft stomach tubes and bougies fail to reach the stomach. Unfortunately, treatment does not seem to accomplish much. Plummer has devised a dilator which is placed in the cardia as a flat bag. When water is pumped into the bag, it swells and so dilates, but the dilatation is not often permanent. The patient promptly relapses and the dilatation has to be repeated. Some weeks ago a man came to the University Hospital with the history of having swallowed almost nothing for three weeks. He had had trouble for a long time; there were times when he could swallow with little difficulty. But for three weeks he had vomited constantly. Repeated attempts to pass a stomach tube had failed. Under ether anesthesia the esophagoscope was passed and the walls of the esophagus examined without finding anything abnormal. The tube was then passed into the stomach without difficulty, thus making the diagnosis of cardiospasm. Under this heading the writer wishes to speak of the hypodermic injection of morphine and hyoscine as an anesthetic in esophageal work. If given in the dose of morphine (1/8 gr.) and hyoscine (1/200 gr.) an hour and repeated half hour before the examination, it acts as a reliable anesthetic in most cases, so that practically no local anesthetic has to be used. Some laryngologists oppose its use: in the writer's cases it has acted as a safe and reliable anesthetic.

Foreign bodies in the esophagus. In the enthusiasm over the removal of foreign bodies through the esophagoscope, one is apt to overlook the usefulness of the instrument in other conditions. For this reason it seemed to the writer that the treatment of other conditions at some length would not be amiss in a work of this kind. There is perhaps nothing more spectacular in the entire domain of medicine than the quick and skilful removal of a foreign body from the esophagus or bronchi through the tube. On the contrary there is nothing more humiliating than to see one attempt to remove a foreign body without some previous experience in tube work. It therefore behooves everyone to practice sufficiently on the dummy and on animals before attempting the work on the human being. In a conversation with a leading local

laryngologist, the writer was told that a friend had borrowed his tubes to practice on a patient whom he had the resident physician keep asleep two hours while he blundered about in the bronchial tubes. The result was that the resident had to sit by the patient all night and stimulate him often for fear that he would die. Such things are deplorable, but will continue to happen until laryngologists realize that this work requires more practice than any other branch of medicine if one would learn to do it well. Such incidents bring the method into disrepute and delay its recognition by the general profession. There is no work capable of doing so much good if well done, and fraught with so much danger if badly done.

At the risk of being accused of repetition the writer wishes to bring out some points which have been mentioned above in order to emphasize them as being very important to all beginners in esophagoscopy. These points are taken from an article on "The Removal of Foreign Bodies from the Upper End of the Esophagus," which was read before the American Academy of Ophthalmology and Oto-Laryngology in August, 1912, and which attracted much attention because the writer advocated a position of the head radically different from all other positions of the head used in this country or in Europe. The article in substance is as follows: The upper end of the esophagus is that part included between the clavicle below and the cricoid cartilage above. In this area foreign bodies usually lodge because at these points the esophagus is narrowest. It may be said that the removal of foreign bodies is practically limited to this area, meaning about an inch and a half in length. Foreign bodies, especially if flat, lodge in the esophagus with edges transverse; as a rule they are located back of the middle line, which accounts for the fact that an ordinary esophagoscope sometimes slips over the anterior plane and the entire esophagus is examined without finding the object. Such cases have been reported by skilled operators. The method of throwing the head over the end of the table, thus causing tense muscles, probably has something to do with not finding the foreign body at once. The writer long ago discarded extension of the head in examining the upper end of the esophagus. He is convinced that relaxation of the muscle is the most important point in the examination, and this can be obtained only with the patient's head practically straight on the table. The elasticity of the tissues allows great freedom of movement and, by manipulation of the instrument, the right angle of the throat become straight. It is

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ure did not take two minutes. The child did not have time to cry and left the table unhurt. In this case there was no abrasion of the mucus membrane.

In September, 1912, the writer was asked by a physician to see his little daughter, who, a week previously, had swallowed a penny. The father, thinking that the foreign body would pass through, paid no special attention to the incident until the mother noticed that the little patient was having difficulty in swallowing, and that she would awake several times at night fretting with pain in her throat. He then had x-ray pictures made, which showed a shadow at about the seventh cervical vertebra or at the upper end of the esophagus. The patient was taken to the University Hospital, where she was immediately prepared for operation. The preparation in these cases is very simple. The patient is taken to the operating room in her street clothes and wrapped in a sheet which is securely pinned so as to reduce movements of the arms and legs to a minimum. She is then placed on the table with the head straight and not over the end of the table. An assistant holds the head while the arms and legs are attended to by nurses. No anesthetic is used; this point cannot be too strongly emphasized, since cocaine is dangerous and ether is unnecessary, except possibly in those cases in which the foreign body has sharp edges or happens to be a pin. The patient was placed on the table as above described with the head held straight. The writer's modification of Jackson's child laryngoscope was passed; this tube measures 17 centimeters in length and 10-millimeters in the inside diameter. When the larynx was reached the spatula end of the tube was hooked around the cricoid cartilage, which was easily raised, and the upper end of the esophagus exposed. The penny was immediately seen lying posterior to the middle line with the edges transverse. Forceps were introduced through the tube, the coin seized and removed. The entire procedure took about two minutes. The little patient was not hurt, the membrane was not injured, and ten minutes after the operation she was taken home in her father's automobile. She made an uneventful recovery. This case has been described in detail to emphasize the value of the straight position of the head and the advantage of using a short instrument in upper esophagoscopy.

A short time ago a boy, 14 months old, was brought to the Presbyterian Hospital with the history of having swallowed a piece of St. John's bread that morning. A physician was called, who resorted to the usual procedure of putting his finger in the child's throat to remove the foreign body,

with the almost invariable result of pushing it further down into the intractable esophagi. Right here it may be well to emphasize the danger of such a procedure, especially if the foreign body is a pin or has sharp edges. The writer knows of one case in which the physician pushed an open safety pin so far down in the esophagus that it could not be seen with the short tube. Fortunately, it did no harm, but it might have resulted seriously. The boy had not been able to nurse all day. He was pinned in a sheet and placed on the table with the head straight. The writer's tube, attached to Brunings' electroscope, was introduced and the foreign body was located with difficulty. While the electroscope gives a good light, the writer prefers the Jackson tube for exposing the upper end of the esophagus because it is more easily handled. The foreign body was so tightly wedged in the esophagus that only by using considerable force with Pfau's forceps could it be dislodged and removed. The stem end of the object went down first.

In December, 1912, a child, 8 months old, was referred to the writer with the history of having swallowed a safety pin. The patient was examined at the Presbyterian Hospital with the head straight on the table. The small tube was passed and the pin immediately came into view in the upper end of the esophagus, with the point open and to the left, sticking in the wall of the esophagus. Instead of closing the pin, the writer tried what he thinks is a simple method of removing it. With the forceps the point was detached from the wall and pulled up into the tube, which was then carried as far to the left as possible; careful manipulation of the instruments caused the body of the pin to slide along the right wall of the esophagus until it passed the intractus, when all the instruments were quickly removed. The removal was successful and the writer is inclined to think that the method will work in the majority of cases. Practically the only danger of injury to the esophageal wall is from the point of the pin; since the body is comparatively smooth, careful manipulation of it will withdraw it in safety.

An interesting case which shows how some foreign bodies will remove themselves in spite of the esophagoscope was that of a child, 6 months old, who, according to the mother's story, was supposed to have swallowed a safety pin. The history was that the mother had a safety pin sticking in her dress with the child's head over her shoulder. Suddenly the child choked and coughed, and when the mother looked for the pin it was gone. She naturally concluded that the child had gotten the pin

stiff to the right or left, saliva dribbles out of the open mouth, dysphagia is immediate and increasing and regurgitation is pronounced. These symptoms are particularly of sharp foreign bodies. With smooth objects the symptoms usually come on later when ulceration caused by prolonged pressure appears; pain is the predominant symptom increased on swallowing and tenderness can always be elicited by pressure on the cricoid cartilage in front or at the sides. If there is impaction at the aortic constriction symptoms are usually mild because the tissues here are more or less yielding. Dysphagia is not extreme and pain is nearly always slight and is referred to the region between the scapulae. Cough is early and persistent. Objects in this location may remain a long time without causing serious trouble, but there is always danger of ulceration through into the aorta with sudden death. Bronner reports the case of a boy who, at the age of 5 years, swallowed a coin. Fluids easily passed into the stomach, while solid food was swallowed with difficulty. For twenty-two months the symptoms were occasional paroxysmal cough, hoarseness and attacks of pain referred to the abdomen. An x-ray picture showed the coin at the level of the fifth dorsal vertebra or opposite the aorta. Fullerton saw a case in which a coin was impacted in this location for seven months; there were no symptoms until three weeks before removal. Jalaguier removed a coin from a child, 4 years old, which had been swallowed when the child was 16 months old. In Halstead's case a child, 5 years old, had suffered from vomiting, regurgitation and attacks of abdominal pain since infancy. The x-ray picture showed a coin impacted opposite the fourth dorsal vertebra which had been there for four and a half years. Impaction at the diaphragmatic constriction is very rare; symptoms are usually persistent and severe. Hiccough is persistent from the beginning; vomiting and pain are common.

Diagnosis of foreign bodies in the esophagus. In many cases, even when the foreign body is small, a definite history can be obtained and the diagnosis is simple, though no symptoms are present. Children are constantly putting things in their mouths and often the mother or the nurse is present and almost sees the object slip down the throat. In nearly every case there is some reflex symptom, such as coughing, choking or gagging, as the object passes down. In those cases where the child is away from home or no one happens to be present when the accident occurs, the primary symptoms may subside quickly, the object becomes fixed in the esophagus and nothing is suspected until the child begins to have trouble in swallowing. At this stage

an x-ray picture may clear the diagnosis if the foreign body will cast a shadow, but if not, an examination with the esophagoscope, which is a very simple procedure in a child, will always make the diagnosis between foreign body and congenital or acquired stricture. In a few cases in which there was no suspicion of a foreign body, an x-ray picture has developed the fact that both a stricture and a foreign body were present, the latter lying above the former. In all the cases, seen by the writer with the exception of one, the diagnosis was easily made from the history, which was definite as to the swallowing of a foreign body. When the primary symptoms subside and no suspicion of the presence of a foreign body exists, the mucous membrane swells around the object and protects it, as it were, sometimes for months or even years. Sooner or later, however, certain symptoms arise which point to the presence of the object and they may appear when it is too late to save life. In one case the only symptom was the sudden rupture of the aorta; the autopsy showed as the cause of death a foreign body in the esophagus which had ulcerated through into the aorta. The edema surrounding the object may go on to ulceration into the mediastinum, the trachea, the pleura or the pericardium, provided the foreign body is in the thoracic portion of the esophagus. In any part of the esophagus an acute inflammation may form in or around the tube with or without abscess which gives rise to severe symptoms, as intense pain, referred to the neck and chest, chills, fever, vomiting and dysphagia. Abscess in the upper part of the esophagus is usually accompanied by swelling of the neck. Rosenthal had a case of a boy in whom a piece of bone, impacted in the esophagus, perforated the wall and into the pleura causing pneumo-thorax. In another remarkable case a stud-button, impacted in the esophagus of a child, 7 months old, caused consolidation of the right lung, perforation of the trachea an inch above the bifurcation and pus in the bronchi and esophagus. Hemorrhage may be the first symptom of an ulceration which has progressed rapidly and insidiously; it has been known to occur as early as the eighth day. In a case reported by Heaton, hemorrhage occurred in a few hours after the impaction of a disc whistle in the esophagus. Hawley saw a case which resulted fatally after three hemorrhages from the esophagus of a boy, 4 years old; the autopsy showed a coin impacted an inch below the level of the arch of the aorta. On each side corresponding to the edges of the coin were deep ulcers, the left one communicating with the descending aorta. The foreign body had been in the esophagus six months.

would otherwise be doubtful, would become very prominent. For the pneumatic method it is indifferent whether the cardia is air-tight or not, as the air finds an adequate resistance at the pylorus for any admissible degree of inflation. Doubtless the diagnosis of an anatomical or spastic stenosis is aided by the process of inflation, as the form and position of the constriction or increased resistance is shown sharply against the expanded lumen. This method may also serve to locate the cardia, which is often difficult to see, and lies very eccentrically, in dilatation of spasmodic origin, and so entrance into the stomach is facilitated. The procedure in pneumatic esophagoscopy is exceedingly simple, and requires no further description. There seems to me to be no danger whatever, provided that due attention is paid to the sensations of the patient, such as a feeling of pressure in the stomach." It will be seen that Brunings is not very enthusiastic over what has been accomplished with "pneumatic esophagoscopy." He seems to think that it has a future, but that it will have to be further developed. The writer has never used the method, hence the quotation from one who has had experience with it.

Dilatation of the esophagus. It is sometimes very difficult to extract large foreign bodies from the esophagus. Chief among these is the tooth-plate, which up to 1905 was successfully removed only five times in fifteen attempts through the natural passage, according to Starck's statistics. Four times it was pushed into the stomach and five times it was removed by external esophagotomy. To obviate these difficulties dilatation of the esophagus has been proposed. Killian in one case passed a steel wire snare around a plate and succeeded in burning through it and removing the fragments. The use of strong forceps for breaking up objects seems to be dangerous, especially if the foreign bodies are sharp. Brunings devised a dilatation esophagoscope which consists of a tube dilating unilaterally in its lower section only, by means of a lever outside. Its maximum width of dilatation is 5.5 centimeters and when this is exceeded the instrument automatically closes again. The tube is introduced by the sense of touch with the blades closed; after it is in the esophagus, it is turned 90 degrees so that "spreading takes place in the frontal plane." The tube is now opened 1.5 centimetres. Forceps are passed and the foreign body seized; the tube is now gradually opened wider and attempts made to dislodge the object, which is then drawn into the tube or turned and loosened so that it can be extracted without danger.

A NEW TYPE OF SCALPEL.

G. S. FOSTER, M.D.,

Surgeon and Pathologist to the Hospital Notre Dame de Lourdes,

MANCHESTER, N. H.

The surgeon's knife is now made in many styles, but they are all similar to a marked degree. They all have many disadvantages. To overcome these I have modeled a new form which well serves my purpose.

The model herein pictured has several advantages. It is easily held within the palm of the hand



without the slightest danger of slipping. The shoulder of the scalpel rests against the thenar eminence, the middle finger passes through the groove, the index finger runs along the shaft toward the blade while the thumb guides, as its ball rests in an indentation on the side of the shaft opposite the index finger.

The blade is so constructed as to permit the entire length to incise at once. The stroke is made by merely moving the fingers. No wrist motion is necessary. Thus a much cleaner and less shocking incision is permitted.

Most scalpels permit the operator to use the distal third of the blade only. This is a marked disadvantage in that a clean, quickly-made and precise incision is quite impossible.

The scalpel herein described allows the operator to always have the full length of the blade in view. No picking or cumbersome movements are necessary. The blade can always be carefully watched and dexterous finger movements eliminate any wrist action.

Blunt dissection is readily carried out with the hilt. This part of the instrument is round, broad and thick. The soft tissues can be separated dexterously with no tearing.

RESUME OF ADVANTAGES

1. Held in a convenient position without finger.
2. Clean and sharp edge, no roughness.
3. Blade always in contact with bone.
4. Finger not used, no pressure on bone.
5. Edge not bent, no tearing of bone.
6. In case of fracture, no pressure on bone.
7. Fits the hand, no pressure on bone.
8. Permits use of the instrument in all positions.

967 ELM STREET

REPORT OF TWO CASES OF FRACTURES OF SIMILANEOUS CLAVICLES BOTH CLAVICLES—2. ANALYSIS CRUSHING FRACTURE OF THREE

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The following fracture cases are sufficiently rare and interesting to be reported.

Simultaneous fracture of both clavicles, as in Case I, is reported in the literature from time to time, but it is unique in our experience, for no other case has appeared at the Emergency Hospital, Buffalo, in the past five years.

CASE I. Mr. S., aged 42, was brought to the clinic March 16, 1944, giving a history that a garbage wagon while he was driving overturned and was struck by a street car, and he fell under the box of the wagon, which probably caused compression of both shoulders.

He sustained fracture of both clavicles, the right occurring at the middle third of the bone, and the left about one inch from the acromioclavicular junction. Reduction was attempted and a double Sayre's dressing was applied, but the patient was of a rather low mentality, considerable difficulty was experienced in keeping the dressing in place. At the end of one week reduction in the right clavicle was about perfect, but no motion on the left side was gained or maintained.

Under ether, closed reduction was attempted, the fragments of the bone brought into position and Sayre's dressing was applied. Three weeks after the operation the patient was discharged, continuing showing the usual good results.

CASE II is a case of fracture of the outer third of the right clavicle and fracture of the middle third of the left clavicle. The patient was a man of 45 years of age, a heavy-set man, who had been employed by a construction company in the detailed job of erecting a building. The fragment of the right clavicle was displaced

about two or three inches in a downward direction without absorption of bone, from a blow taken place at the end of a work week.

Mr. P., aged 31, was brought to the clinic February 9, 1944, giving a history of having been



FIG. 1. Patient with fracture of both clavicles.

struck by a wagon loaded with coal. The total weight of the wagon and contents being about three and one-half tons. The patient was walking alongside the wagon, and endeavoring to keep warm, when the wagon rolled off on the snowy pavement, and a heavy load of the coal landed upon his head.

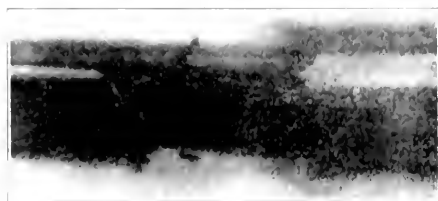


FIG. 2. Patient with fracture of both clavicles.

Under ether, closed reduction was attempted, but fracture of the junction of the middle and lower third of the right clavicle was attempted and lateral plates were applied. As a ray picture taken seven days later showed a perfect fracture of the rib and humerus, it was determined that a fracture of the entire length of the bone had been completely separated from the rest of the length of the fragment corresponding to the middle third of the bone. The separation of the bone was made with a high cutting of the surface, while the lower was an oblique fracture. Since the bone was found to be a complete separation, it was decided to attempt a closed reduction.

Under ether, the bone was reduced and the upper end of the fragment was inserted into the lower portion of the rib and the lower end of the fragment was inserted into the bone. The fragment was held in place by a wire and a plaster operation. The patient was discharged three weeks after operation and was able to work on the job. At the end of three weeks the patient was discharged with no further treatment and was able to work on the job.

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WALTER M. BRICKNER, M.D., Editor
NEW YORK, NOVEMBER, 1914.

THE LANE PLATE.

The enthusiasm for the employment of Lane's metal plates for the fixation of fractured bones appears to be very much on the wane. This is as might have been expected. We have previously expressed the opinion, based on careful observation, that metal plates and screws applied to the broken bone ends are sometimes of *themselves* a cause of non-union, and that autoplasmic bone grafts used as splints or even only as osteogenetic factors, are far preferable physiologically. It is interesting to note the increasing use of such bone grafts in place of metal materials. Animal tissues are intolerant of foreign bodies. To be sure, needle fragments, bullets and other small metal substances often remain indefinitely and innocuously buried (usually in the muscles), and the same is true, very often indeed, of sutures of silk and linen in uninfected tissues. To be sure, too, metal plates and screws sometimes abide peacefully on and in human bones for long periods, perhaps even indefinitely, but such instances are the exceptions that prove the rule. Metal plates for filling cranial defects rarely remain in place for long, and the silver filigree sometimes used in very large hernie is also always a doubtful expedient. Such a device is sometimes necessary, indeed, and so too, no doubt, is the metal bone plate or screw. But for most cases, at least, we believe that bone grafts and bone dowels are vastly to be preferred to metal ones. And, too, although we would not quarrel over the point, we regard such absorbable

materials as kangaroo tendon and chromicized catgut as preferable, in most instances, to silk and linen, for buried sutures and ligatures.—W. M. B.

STIFF AND PAINFUL KNEE.

Not a little has been written in recent years concerning that often very puzzling condition, "stiff and painful shoulder"—puzzling often as to etiology, diagnosis and treatment. Thanks to the strides of a few observers, notably Cadman's concerning subacromial bursitis and T. Turner Thomas' concerning sprains and tears of the capsule, some of the varieties of shoulder disability are now much better understood—although concerning even these varieties many fallacies are still current.

The knee, a more complicated joint than the shoulder, and, like it, surrounded by tendinous structures and bursae, is, also like it, subject to puzzling conditions of prolonged disability after comparatively minor traumata.

Three recently published articles by Ernest Finch and Edred M. Corner of London and Robert Jones of Liverpool deal very lucidly with derangements of the knee joint, emphasizing, especially, however, dislocation of the semilunar cartilages, lacerations and gross sprains, loose bodies, rupture of the crucial ligaments and fracture of the tibial spine.

One or other of these conditions no doubt accounts for a considerable number of the cases of traumatic stiff and painful knee. There is no doubt, however, that there remains a still larger number of cases of prolonged knee disability, some traumatic and some developing, apparently, spontaneously, in which these internal derangements can be excluded. It seems not unlikely that in many of these the lesion is, as in the shoulder, entirely extra-articular and that greater attention to the tendons and bursae in the neighborhood of the joint may reveal a condition or set of conditions, perhaps akin to supraspinatus tendon tear and subacromial bursitis, that will much illuminate some of the still obscure types of stiff and painful knee.—W. M. B.

AMERICA'S MEDICAL OPPORTUNITY.

We are told that the European war will prove to be America's industrial opportunity, that the paralysis of enterprises abroad will provide new markets for our own enterprises, that much of the foreign trade of the nations at war can be absorbed and perhaps permanently retained by America. The same conditions apply to post-graduate medical teaching. Certain it is that many of the large num-

Surgical Suggestions

It is a common mistake to think that the only way to get rid of a tumor is to cut it out. In fact, many tumors can be treated with surgery, but only if they are found early enough. If a tumor is found late, it may have spread to other parts of the body, making it much harder to treat. So, it's important to get regular check-ups and to see a doctor if you notice any changes in your body.

For example, if you have a skin tumor, you might want to get it removed before it grows too big. If you have a tumor in your lung, you might want to get it removed before it spreads to other parts of your body. So, it's important to see a doctor if you have any symptoms of a tumor, such as a lump, a sore, or a change in your voice.

There are many different types of tumors, and each one has its own set of symptoms and treatments. So, it's important to see a doctor if you have any symptoms of a tumor. They can help you figure out what type of tumor you have and what the best treatment is for you. They can also help you decide if you want to have surgery or if there are other options available.

One of the most common types of tumors is a skin tumor. These can be found on any part of the body, but they are most common on the face and neck. They can be small and harmless, or they can be large and dangerous. So, it's important to get regular check-ups and to see a doctor if you notice any changes in your skin, such as a lump, a sore, or a change in your skin color.

Another common type of tumor is a lung tumor. These can be found in the lungs and can be small and harmless, or they can be large and dangerous. So, it's important to get regular check-ups and to see a doctor if you have any symptoms of a lung tumor, such as a cough, shortness of breath, or chest pain.

Surgical Sociology

Ira S. Wile, M. D., Department Editor.

HOSPITALS CRITICISED.

C. H. Mayo, in the *Modern Hospital*, October, 1914, criticises directly or by implication many factors in hospital organization. It is unnecessary to discuss in detail the numerous points brought out by Dr. Mayo, but certain phases at least merit passing consideration.

Because of the peculiar conditions existing at Rochester, Minnesota, and because of the rush of patients which overcrowds the hospital proper, surgical patients are seldom retained in the hospital for longer than one or two weeks. As soon as possible the surgical patients leave the hospital and are transported to a hotel or private home, where they receive their further treatment.

Upon this local experience Dr. Mayo criticises as inefficient the maintenance of patients in hospitals for the period of time necessary for convalescence. He states that "To keep a patient in the hospital longer than is necessary is an unwarranted expense to him or an unjustified tax on those who contribute to hospital expenses, besides keeping some other needy patient from being cared for." As far as the expense to the patient is concerned, it must not be forgotten that the patient under the Rochester plan continues to have an expense as a result of transportation to another institution. On the other hand, the facilities for surgical care in private homes are by no means equal to those afforded in a hospital.

In general, the criticism has been leveled against hospitals that they fail to send out their patients in a condition enabling them to resume their activities. It is true that convalescence is often protracted and there is a pronounced need for the establishment of convalescent homes. The cost of such institutions, however, would in no wise decrease the expenditure of the patient now retained in the beds of private hospitals. It is desirable, until such retreats for convalescent patients can be established in sufficient number, that patients be retained in the hospitals until their condition warrants removal to their homes. In the case of the poor whose homes are not the best places for the promotion of good health, it would be far better hospital efficiency, viewed from the standpoint of end-results, to retain the patient until his restoration to health is practically established.

All cities do not have the perfect systematic organization that exists in the city of the Mayos, and consequently hospitals are unable to empty their beds with the rapidity and facility which exists in that well-developed surgical center. It is unfair, however, to criticise this particular type of hospital activity as inefficient, merely because the beds are not released as quickly as is possible at the St. Mary's Hospital, where almost all of the patients pay for their care and treatment.

One point of implied criticism deserves especial consideration. It is suggested that many surgical

procedures, particularly upon the female sex organs, should be discarded, but are being performed owing to a lack of knowledge of their after-results. Obviously, with proper investigation of hospital surgery there should be some indication of the actual surgical result, not merely at the time of discharge from the hospital, but after the lapse of a sufficient period of time to test its value.

The doctrine of efficiency has not been established for a sufficiently long period of time to have provided the type of record that is essential for determining the success or failure of operative procedures. Until such figures are available, it is necessary for surgeons to utilize their best judgment, based upon known facts in determining the type of operation that shall be performed. It is true, however, that conservatism in surgery is more necessary now than ever. The preservation of a careful technic has robbed ordinary surgical procedures of most of their dangers and surgical mistakes do not necessarily involve loss of life, though they may impair function. The impairment of function, however, demands every thought on the part of the operator, because it may seriously interfere with the development of a normal life on the part of the patients.

"A hospital should be responsible for correct records of all operations and treatments of patients who enter the institution. This should be made by the superintendent, registrar, or interne, and kept, not for public inspection, but as a record for increasing hospital efficiency. The report showing the mistakes in diagnosis, and the number of patients who came back for a second operation because the first did not benefit, would be instructive. The number who have evidently more than one trouble, the presence of which could so easily have been found by observation at the time of the first operation, becomes a serious matter when we think of the lost time, double risk, and burden of expense thrust unnecessarily on such patients or on the community."

This paragraph contains a thought of immense importance in the development and maintenance of hospital efficiency. Hospital abuse should not be tolerated. Undoubtedly, many hospitals at the present time are unknowingly being subjected to procedures which are contrary to the spirit of modern medicine and reflect discreditably upon medicine and surgery. Unfortunately, many hospitals, characterized as public in their scope, are veritably private hospitals assisted from public funds for the benefit of a few physicians and surgeons who have actually come to believe that the institutions exist for their own personal aggrandizement, improvement and commercial betterment.

Surgeons themselves should be the first to criticize their own institutions and to watch with the utmost care the character of the work performed by their colleagues in surgical cases. Wholesome criticisms of a constructive nature leading to the betterment of the surgical fraternity are always desirable. The more quickly hospitals are purged from irritating forces, the better it will be for the hospitals, the patients, and the profession.

Progress in Surgery

A Résumé of Recent Literature.

Experimental and Clinical Studies of Colon Stasis.

J. R. EASTMAN, Indianapolis. *Journal American Medical Association*, Aug. 8, 1914.

The subject of colonic toxemia, can be studied under the four headings of (a) colitis; (b) adhesions, membranes and kinks; (c) colon dilatations and visceroposis, and (d) stasis. Many questions of alimentary toxemia are more or less dependent on these factors. As regards the causes of these conditions those which are more or less commonly found in dogs and can be produced in rabbits, are discussed. Many writers have expressed the belief that plastic adhesions can be produced by toxins in the large intestine and Bassler has described a bacterium to which he ascribes the origin of pericolic adhesions. Adami also supports the view of a bacterial origin. The clinical consequences of membrane formation are somewhat varied but this does not prove that they are always responsible for stasis. A delicate vascular form of membrane may exist without constipation in young persons and is found in most every case of chronic appendicitis, which it probably favors. Pericolic adhesions nearly always give rise to some disturbance and has been able to occasionally relieve colon stasis by division of a surrounding membrane. It seems reasonably fair to say that such membranous adhesions may induce colon stasis and also favor the penetration of bacteria from the bowel and thus reproduce themselves. Somewhat similar interchange of cause and effect is presented in colon poisis and seems to be almost constantly associated with it. The treatment must vary according to the peculiarities of each case. Purely medical treatment with petroleum oil, Weir Mitchell feeding according to Coffey's plan and a medical treatment aimed at arrest of intestinal infection, all may have their value, and hygiene, regular vigorous exercise and proper living, will do still more. The surgical treatment is not yet fully ready for discussion. Among the methods proposed he mentions those of Coffey and C. A. L. Reed and those of Arbuthnot Lane whose best known operative exploits are based on Metchnikoff's theory that we are better off without a colon. Whichever method is used should be determined after the abdomen has been opened and explored and not fixed upon before operation. Little is to be expected from very extensive removal of pericolic membrane. If short-circuiting is done, special care should be exercised in selecting the colon surface to be anastomosed. Anastomosis of the caput-coli at its lowest level with the rectum has all the advantages and eliminates some of the evils of ilioecostomy. The opening of communication should be amply large and the appendix, though normal, should be excised if in the way, as should also the sigmoid, if dilated and very redundant. The improvement following short-circuiting operations is probably due somewhat to the relief of colitis or the associated factors. Direct drainage favors the escape of bacteria-laden secretions which aggravated the colitis and this is a probability in stasis cases where the colon is not fettered by firm adhesions. Where the colon is not thus hopelessly fettered the purpose of a well-planned short-circuiting operation should be not to put the colon out of commission but by relief of colitis and pericolicitis to put it back into its normal function.

Resection of the First Portion of the Large Intestine and the Resulting Effect on Its Functions.

W. J. MAYO, Rochester. *Journal American Medical Association*, Aug. 8, 1914.

The variations in anatomy and the function of the large intestine are reviewed by Mayo, who points out the different uses of the part proximal to the splenic flexure and the descending colon and sigmoid. The changes in function in early life are pointed out and reasoning from analogy he says we can assume that the functional activity

of the proximal half of the large intestine concerns vegetable intake. In the herbivora this portion is a sort of silo in which fermentation of vegetable materials takes place, developing nutritive products of great value. Within the past one hundred years it has been shown that the flesh intake of man has been increased four-fold and its decomposition in the intestine develops poisonous products which may be absorbed, and Mayo describes a peculiar form of silent constipation with thin-walled bowel and no abdominal distention, accompanied with symptoms which may be attributed to neurasthenia or even be mistaken for exophthalmic goiter in severe cases, which he attributes to such absorption. From a small number of patients—about twenty—with exaggerated conditions of seccolic stasis and associated nervous symptoms, he has removed ten inches of the terminal ileum, appendix, cecum, ascending colon, hepatic flexure and a portion of the transverse colon, not trespassing to any extent on the transverse colon which contains the omentum. If all the omentum is removed damaging adhesions subsequently occur, with disastrous sequels. In all the cases in which this resection was made and the ileum joined to the transverse colon, there has been marked improvement and relief from constipation. Nearly all of them had been operated on before for appendicitis, etc. He thinks that it removed the cause, in some cases at least, of the existing intestinal toxemia.

Although the operation is a serious one, none of the patients has been lost, but the number of persons for whom it is suitable is, Mayo believes, a very limited one.

Observations on the Movements of the Isolated Human Vermiform Appendix.

J. A. GUNN and R. H. A. WHITELOCKE, Oxford. *The British Journal of Surgery*, July, 1914.

Although in the nature of a preliminary report, the observations of the authors are sufficiently significant to be reviewed. Gunn has shown that the removed mammalian organ ceases contracting when placed in ordinary Locke's solution, but, when supplied with oxygenated Locke's solution at body temperature, the contractions return. With this knowledge it was possible to investigate any excised tissues removed at surgical operations. Experiments of this nature are of course far removed from those possible with human tissues removed postmortem.

The authors found that in the isolated human appendix "there are typically present larger contractions with (usually) superimposed smaller contractions." The excised rabbit's appendix was then found to have a similar contractile wave. It was compared with the movements of the appendix in situ, and a close parallel was found. The authors therefore believe that the movements of the excised human appendix closely simulate those of the human appendix in situ. The authors then demonstrated that, as was expected, the appendix has a double nerve supply—splanchnic and pelvic visceral. The most lively movements of the appendix were found in the organs removed from young patients under ten years of age. The last point established up to the present is "that a very severely inflamed appendix may still show spontaneous movements of not definitely aberrant type."

The Use of the Omentum in Abdominal Drainage.

L. S. RAMSELL, Manistec, Mich. *The Journal of the Michigan State Medical Society*, September, 1914.

Ramsell believes that tucking the omentum around the infected area in an abdominal wound and securing it by a stitch or two of fine gut, is a great safeguard against spreading the infection. He uses the omentum in this way as soon as the infected area is opened and then uses gauze packings. The procedure protects the rest of the abdominal cavity from free pus which would result in peritonitis or secondary abscess. It requires little handling of the bowels and less packing. It requires a smaller incision. It assures better and quicker drainage. It does away with too large a drain. It localizes any secondary hemorrhage. It causes less liability to the formation of post-operative adhesions.

The Clinical Picture of Osteochondritis Deformans Juvenilis. DR. BRANDES, Kiel, *Medizinische Klinik*, July 12, 1914.

The author summarizes the present state of our knowledge concerning this new clinical entity. His own experience includes ten cases observed in the Kiel Surgical Clinic. The disease is one occurring in children from three to fifteen years of age, more often in boys than in girls. The onset is gradual with the appearance of a limp and very slight pain. The limp increases until it is very pronounced. Examination reveals slight atrophy of the affected leg with prominence of the trochanter. Pain is referred to the hip. There is no pain on pressure or jolting of the limb. There is shortening of the affected limb of not over 2 cm. Flexion, both active and passive, is free, but there is very marked limitation of abduction at the hip. This is the characteristic feature. Rotation and adduction may be slightly impaired.

The course is exceedingly chronic, the disease however usually finally healing and having a fairly sound extremity. Roentgen examination shows various degrees of destruction of the head of the femur. The process begins subchondrally and rarely attacks the acetabulum.

The author points out that the pathological characteristics are not the same as those found in senile osteoarthritis, and that this disease occurring in childhood has a distinct course and pathology and must be considered a separate clinical entity.

The prognosis is good and the disease must be clinically differentiated from coxa vara and acute coxitis.

Sacro-iliac Displacement. JAMES K. YOUNG, Philadelphia, *Interstate Medical Journal*, August, 1914.

Many cases of rebellious sciatica, lumbago, backache and kindred affections find their etiology in some abnormality of the sacro-iliac articulation. The normal tonicity of the pelvic ligaments are prone to suffer in instances of passive congestion, menstruation and pregnancy.

The simplest abnormality of the sacro-iliac joint is strain whose disappearance depends upon the correct reciprocal action being readjusted between the various groups of muscles. If the strain continues, however, there results a sudden or gradual displacement or giving away of the ligamentous attachments, associated with pronounced instability of the joint. Slight luxations are prone to affect other joint structures in the pelvic girdle.

The clinical varieties are: (1) traumatic, (2) static. The former may follow very slight trauma as a misstep. The latter is mechanical in character and is divided into a neurotic and a uterine variety. Likewise the locking of the sacro iliac articulation through enlargement of the transverse process of the last lumbar vertebra may also give rise to sacro-iliac strain.

The symptoms are pain, limitation of motion, abnormal mobility and changes in attitude.

Reduction may occur spontaneously, but recurrences are usual. When reduction cannot be effected spontaneously, place the patient on his face, produce forced extension with traction on the limb, or place the patient between two chairs, a foot and a half apart, and make downward pressure over the site of the joint. It is sometimes necessary to resort to forcible correction under anesthesia. The joint is then immobilized by plaster or an orthopedic apparatus. In the after-treatment massage, electricity and vibration are of greatest importance.

Bone Transplantation Into the Spinous Processes of the Vertebrae for the Cure of Tuberculous Spine Disease. CHARLES M. JACOBS, Chicago, *Illinois Medical Journal*, August, 1914.

From a study of nine cases which the author reports in detail, he draws the following conclusions:

1. In children, with caries of the cervical, lower dorsal and lumbar vertebrae, conservative treatment should be the first resort; in middle and upper dorsal Pott's disease or where conservative treatment has been tried with disappointing results, Albee's surgical method is the treatment par excellence.

2. In adults, where time plays an important part and where rapid results are desired, surgical treatment is the method of selection.

3. The value of a good skiagraph of the tuberculous area of the spine cannot be overestimated. A definite knowledge of the extent of the pathologic process should be had before proceeding to operate. Success here depends, primarily, upon the graft being implanted into the spinous processes of all of the diseased vertebrae and at least two contiguous vertebrae above and below them.

4. Too early reliance cannot be placed on the strength of the bone graft. It takes time for the splint to become securely fixed by permanent callus.

5. External support, either casts or braces, must not be disregarded for many months following the operation.

6. Even with continuation of post-operative external support for a period of six to twelve months the duration of treatment is much shorter than the average duration under non-operative treatment.

7. Albee's surgical method incurs no serious risk to the patient. But the operator who has not been particularly trained for this work may expect unpleasant results.

Aperiosteal Amputation. H. H. M. LYLE, New York *Journal American Medical Association*, October 3, 1914.

Lyle advocates the aperiosteal method in amputations. Hirsch's investigations showed that in the old method of stripping up periosteum cuffs to cover the bone many shreds of periosteum resulted and produced painful bony spikes, interfering with the function of the stump. He reintroduced the Celsian method of dividing periosteum and bone at the same level, adding to it massage, exercise and early use. Bunge went a step further and advised the removal of 1 cm. of periosteum and the scraping out of bone-marrow for a similar distance. This method had an extensive practical test in the Russian, Japanese and Balkan wars. Lyle quotes Ranzi's statistics from Von Eiselsberg's clinic of the results of aperiosteal amputations of the leg which were very satisfactory on the whole. The remarkable feature of that report is the number of stumps obtained in infected cases. Lyle gives the technic in full. He concludes that while the osteoplastic method is ideal, it requires ideal conditions. The tendinoplastic is of limited value, the periosteal, though employed by the majority of surgeons in this country, is inferior to other methods. The aperiosteal, in the advent of complications of healing, is the only one that will give a useful end-bearing stump and is the simplest and most generally practicable.

Arthrotomy for Injuries of the Menisci by Longitudinal Incision Through the Patella. (*Eröffnung des Kniegelenkes bei Meniscus-verletzungen durch Laenyschnitt mitten ueber die Patella und deren Durchsaegung*.) P. BABITZKI, Kiev, *Deutsche Medizinische Wochenschrift*, July 30, 1914.

The usual methods of operating upon the knee-joint are generally planned for ankylosis following the operation (tuberculosis, neoplasm). The author finds that the operations devised for exposure of the joint in order to treat injuries of the menisci are inadequate, because the exposure is incomplete. After study on the cadaver Babitzki employed the following technic with excellent result: Free vertical, incision crossing the patella. The latter is fixed by slightly flexing the knee and is longitudinally divided through its middle. The halves are then forced to the lateral aspects of the condyles, and rotated outwards at the same time. An excellent exposure of all the recesses of the joint is thereby obtained, the joint being fully flexed. The wound is sutured in layers, suture of patella being unnecessary.

Contribution to the Study of Syphilis of the Bladder. (*Contribution à l'étude de la Syphilis Vésicale*.) G. GAYET and FAYRE, Lyons, *Journal d'Urologie Médicale et Chirurgicale*, July 15, 1914.

Vesical syphilis is generally considered an extremely rare lesion. Until 1900 the diagnosis was made only on the basis of results from anti-syphilitic treatment. Matzenauer then demonstrated the first case by cystoscopic examination; about twenty cases of tertiary lesions have since been demonstrated. The lesion may consist of a

bined, producing infiltration and molecular disintegration of tissues and resulting ulcer. In many cases occupation requiring long standing, etc., may be the cause. The relation of ulcer to varicose veins is still in dispute as it does not follow varicosity in all cases. The gouty diathesis, trophicuroses, and local asphyxias have been suggested as causes. Bacteria have been found in Ravogli's examination, most frequently *B. pyocyaneus*. The process is one of infiltration and softening of tissues cutting off the nutrition, invasion of bacteria, gangrene and sloughing. The three periods of necrosis, sloughing and reparation should guide the treatment. The first period is marked by acute inflammatory symptoms. The patients usually go to the drugist and ask for a salve which relieves the pain but makes the condition worse, by obstructing the sloughing off of the gangrenous masses retaining the bacteria-laden secretion and increasing the inflammation. The best application for this period is water at 80° or 90° degrees temperature and containing some antiseptic preparation. Ravogli uses sodium bicarbonate or borate in the water. If the ulcers are very foul solutions of mercuric chlorid, from 1 to 5,000 to 1 to 2,000, either as a continuous bath or in moist compresses. But as soon as the odor has been overcome he goes back to the bicarbonate or borate solution. In some cases, especially when *B. pyocyaneus* is present he has found phenol useful, in warm water. If the patient can be recumbent with the leg elevated the pain and inflammatory symptoms will subside sooner and the ulcers show a clean surface with healthy granulations. In this condition it needs to be dressed with some remedy which will cover and protect the granulations and remove the secretions and keep the surface sterile. One of the oldest standbys has been a mixture of castor oil and from 10 to 50 per cent of balsam of Peru. When this is irritant he changes it for some more suitable application. Many remedies which favor the granulation delay the formation of epithelium and for this remedies producing oxygen seem to be called for. For many years Ravogli has used diachylon salve containing 1 gram of ichthyol to the ounce. He still uses this in obstinate cases, but in ordinary cases he finds useful petrolatum with 2 per cent boric acid on a piece of lint changed twice a day. Various preparations have been recommended by authors some of which are mentioned. Ravogli objects to the use of thick paste. During the process of repair it must be aided by proper measures. Internal treatment must be given according to the condition of the patient. In his hospital service he always advises the use of potassium iodid, knowing that phlebitis is often originated, maintained and aggravated by a leucic taint. An alkaline purgative is recommended when constipation is present and there is some gouty tendency. In case of anemia from poor nutrition proper remedies should be given. After recovery to prevent relapse he advises the patients to bathe the legs twice a day, to massage the affected leg with 2 per cent alcoholic solution of phenol and when dry dust it with rice powder or talcum powder, also to wear during the daytime a well-fitting elastic stocking.

Remarks Upon the Effects Observed in the Use of Mixed Toxins (Colby) in Certain Cases of Sarcoma. T. W. HARNER, Boston. *Boston Medical and Surgical Journal*, August 13, 1914.

Harner's conclusions are based upon observation of 91 cases; for various reasons, only 32 of these cases are valid to determine the end results.

1. The treatment of primary or recurrent inoperable sarcoma with mixed toxins must be intensive. The severity of reactions may be lessened by certain measures and I see no contraindication to such humane practice. The increment of dose and the interval between injections requires some experience but, even after a considerable experience, this method of treatment is always uncertain.

2. This method of treatment is so uncertain and so distressing that,

(a) Its institution is unjustifiable in any case in which operative measures of reasonable safety offer possible hope of removal.

(b) A frank statement of the nature and severity of the reactions and the possibility of benefit should be made

to the patient or some responsible person before treatment is instituted.

(c) It should be instituted in no case unless proven microscopically to be sarcoma.

(d) Its institution is unjustifiable in all cases of inoperable sarcoma.

3. The percentage of apparent cures may be regarded as varying from 9.4 to 18.8.

4. This study suggests that the toxins offer no expectation of benefit in cases with multiple melanotic growths, in cases with mixed cell growths, in cases with intra-abdominal growths, and in cases with growths arising from subcutaneous tissue or bone, excepting perhaps giant cell growths. It suggests that they may be legitimately tried in cases with single melanotic growths. It suggests that they are apparently of value in cases with sarcomata arising in nose and accessory sinuses, whether spindle cell, giant cell, or round cell.

5. The operative treatment of true giant cell tumors gives in the majority of cases such good results that the toxins are not indicated. Their use is, however, warranted in those cases in which the growths are so situated that complete surgical eradication is impossible (such as giant cell tumor of the spine) and in these cases, I believe that the attack should be primarily surgical, followed immediately by toxin treatment.

The Significance of the Thymus Gland in Graves' Disease. W. S. HALSTEAD, Baltimore. *Bulletin of The Johns Hopkins Hospital*, August, 1914.

In this paper, which was read before the Harvey Society in New York Halstead discusses the relation of the thymus gland to the symptoms of Basedow's disease. Especially within the past few years has attention been called by several European surgeons to the fact that in many cases of Graves' disease the thymus gland is pathologically enlarged. Garre and Capelle have shown that after thymus extirpation the blood picture returned to normal exactly as after strumectomy. The juice expressed from an enlarged thymus, when injected into animals, produces the Kocher blood picture. Prompt implantation of normal thymus in thyroidectomized dogs prevents the appearance of cachexia strumipriva. Typical Basedow symptoms have been produced by the intraperitoneal implantation of hyperplastic thymus.

These facts all go to prove the close relation existing between thymus and thyroid. Within the past year von Haberer has reported quite wonderful results in several cases of extremely severe Graves' disease in whom removal of a portion of the enlarged thymus led to a prompt recovery in apparently hopeless cases.

Halstead reports two cases of his own in whom portions of the thymus were removed together with partial thyroidectomy. Both cases were greatly improved, though it is not possible to say how much was due to the thymectomy. The results of the combined operations have been, without exception, remarkably good; unmistakably better than when the thyroid alone is operated upon. Particularly striking has been the relative absence of the reaction which is usually observed in the 36 or 48 hours following thyroid lobectomy.

The Roentgen-ray and the percussion note over the area occupied by the thymus may give useful information; but the absence of both dullness and shadow does not exclude the persistence of the gland, nor do we know as yet how small a thymus may be responsible for the symptoms. It has been estimated as a result of non-operative clinical investigation that in about 40 per cent. of all cases of exophthalmic goiter the thymus is persistent.

The exact relationship existing between the thymus and thyroid glands has not yet been determined, though there is much evidence being brought forward that the former may be more closely associated with vagotonic symptoms, the latter with sympathetico-tonic.

The author believes that in severe cases after tying off the arteries, thyroid lobectomy should be done, and that if one is confronted with an enlarged thymus, a partial resection of the gland is indicated.

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New York, N. Y.

The educational value of fracture statistics to our profession is still. Workmen, however, are insured, and they are entitled to the best of being taught, and when they are not fully instructed, it will very materially increase the burden of our treatment of fractures.

Wherever the studies of the structure of accidents it is universally found that a collapse of structure and falls of materials cause the larger number of accidents, and the results of these accidents are wounds and fractures. The relative severity of these injuries is best illustrated by the consideration of the time lost as a result of them, and the highest average is shown by any of the injuries is due to fractures.

To illustrate with a specific example from the 1933 Annual Report of the Industrial Insurance Department of the State of Michigan, 12,481 cases of partial disability received \$4,140 compensation for 34,000 days of disability, averaging 12.6 days per case. The total compensation for 1,383 cases of permanent disability was \$1,222,000 for 60,000 days of disability, or 43.5 days per case, which, also, amounts to 12.6 days per day of partial disability received. 27 per cent of the total compensation for permanent disability was for 2 per cent of all fractures still suffered from permanent partial disability. Some examples will be shown wherever a complete disability period has been indicated but in many cases, at the same time, there is no disability indicated at all. However, a certain number of Michigan permanent disability cases will be presented, and, during the compilation of Michigan statistics, it is noted that nearly all of the cases of permanent disability are of laboring occupations, and that the compensation will be paid for a longer period of disability than for the non-laboring occupations. A study of permanent disability cases in the State of Michigan will be made in the near future.

1. $\text{Pr}(\text{rain}) = 0.3$
 2. $\text{Pr}(\text{no rain}) = 0.7$
 3. $\text{Pr}(\text{rain} | \text{rain}) = 0.8$
 4. $\text{Pr}(\text{no rain} | \text{rain}) = 0.2$
 5. $\text{Pr}(\text{rain} | \text{no rain}) = 0.1$
 6. $\text{Pr}(\text{no rain} | \text{no rain}) = 0.9$

should not read books, but visit the law courts and listen to an unfortunate doctor explaining what a "satisfactory result" is. This too elastic phrase has become obsolete, for it did not conform to any uniform standard.

Fracture of the femur occurs in about ten per cent. of all fractures and offers by far the greatest difficulties in its treatment. As its injury most seriously incapacitates the workman, it is of unusual importance to investigate the end-results of the present methods of treatment and to suggest how these may be improved.

The following authorities present the statistics of end-results which are at present most available for study:

1. Von Bergmann reports 121 cases in which 39, or 32 per cent., fully recovered, the average period of disability being 54 weeks.

2. The British Fracture Committee reports 727 cases, of which 298 were over 15 years of age. Of 87 fractures of the neck, 20, or 23 per cent., recovered good function; of 49 fractures of the upper third, 23, or 47 per cent., recovered good function; of 108 fractures of the middle third, 53, or 49 per cent., recovered good function; of 54 fractures of the lower third, 30, or 55 per cent., recovered good function.

The 126 cases including all groups averaged only 42 per cent. of good function.

In 179 cases the average period of disability was 33.6 weeks. In 21 cases, or 11 per cent., the disability was permanent.

3. Scudder reported 35 cases, of which 16 were adults (between 18 and 48 years of age). Of these, only 5, or 31 per cent., were perfect. The working capacity of the remaining 11 was depreciated by limited knee-joint movements, pain after working, lameness in walking, weakness in the whole leg, and lack of endurance.

4. Hitzrot reported 20 adults between 15 and 76 years of age. Of 16 cases treated by non-operative methods, 15 recovered perfect function within 52 weeks. In 4 cases where the overriding could not be reduced, operation was performed and good function was secured within 52 weeks.

5. Ashhurst traces 21 cases out of 58 treated in the Episcopal Hospital, Philadelphia. Five recovered perfect function, 8 others were able to work but still limped, so he concluded 13, or 62 per cent., secured useful limbs. However, of these 21 cases, 11 were under 16 years of age.

6. Faltin, after studying the compensation awards made by the insurance companies in Sweden, reported the average period of temporary disability

at seven months and that partial disability continued for three to four months longer.

The above statistics have been collected from surgical literature and we already see that the widest variations and obvious inaccuracies exist. Thus far, the different states have not yet classified their statistics sufficiently to give the data of different fractures, such as femur, tibia, etc. In 1912, Minnesota published its 13th Report of the Bureau of Labor. In 1,230 of the various fractures recorded during 1910, 1911, and 1912, under the compensation law, 467 were classified as fractures of the hip, thigh, knee, and ankle. No statement was made regarding the percentage of good results. In only 516 out of the 1,230 cases was the length of disability recorded, but it was stated that in *only* 13 cases was it more than 24 weeks and *no* case exceeded 36 weeks.

The above-mentioned Washington insurance report states that of 67 cases of fracture of femur, 53 of which were treated without operation averaged 158½ days of disability and 14 cases treated by operative methods averaged 209 days.

Unsatisfactory and disappointing as these statistics are, how very startling are the following which have been followed up most scientifically by the Austrian government in obedience to the requirements of the insurance societies in 1911. These records are of the greatest value and tell a different and sadder story than that of our incomplete and inaccurate professional records. There were 857 fractures of the femur, of which 153, or 17.8 per cent., recovered with only temporary disability, but the length of this disability is not stated; 683, or 79.7 per cent., suffered some permanent disability; 99 had a loss of 9 to 19 per cent. of their earning power; 120 a loss of 19 to 32 per cent.; 134 a loss of 33 to 48 per cent.; 330 a loss of over 50 per cent.; 38 per cent. of all cases suffered a loss of 50 per cent. earning power.

It is now very evident that it is impossible from all these confusing statements to determine an accurate standard for the duration of disability. We must first accurately record and follow up to the end our own cases to learn the results of our own methods. The more carefully fracture patients are followed up, the more astonished we are to learn how many men are permanently more or less disabled and how rarely ideal functional results are secured. All general hospital records are notoriously inadequate, for the end-results are seldom stated. Patients are discharged as cured when they leave the hospital at the end of eight to ten weeks, although they go away on crutches. True,

traction that maintains correct alignment will also at the same time secure good anatomical position. This corroborates the findings of the British Fracture Committee—that where the anatomical result is good, then the functional result is good in 90.7 per cent.; but that when the anatomical result is moderate or bad, then a good functional result occurs in only 29.7 per cent. It is therefore of the highest importance that the surgeon secure anatomical reduction.

Bad results are nearly always associated with angulation and are largely due to that cause. This is conclusively demonstrated by the study of any large series of radiograms. Angulation results from ineffectual traction.

In children, traction is much more easily applied and far better maintained; the muscles are less resistant, the weights smaller; the child is lighter and smaller and more easily lifted into correct position by one nurse or attendant house officer, consequently normal alignment is more often maintained. These facts largely explain why the results are far better in children than in adults where traction is far more difficult to maintain.

Under 15 years of age, in 1,016 cases, good functional results were obtained in 90.8 per cent.

Over 15 years of age, in 1,580 cases, good functional results were obtained in only 45.4 per cent.

(3) *Radiograms* must be systematically employed in all cases of fracture of the femur to control the results of reduction. While some may be misleading, yet when made by a qualified operator, they furnish the best records of the relative position of the fragments and they give invaluable assistance in showing how unsatisfactory results may be improved.

Hereafter, in seeking compensation, the patient will surely secure a radiogram, so it is therefore advisable for the surgeon to have previously fortified himself. Courts have generally decided to accept radiograms as evidence. I therefore thoroughly agree with Estes that no physician should undertake the care of a fractured femur unless he can have the benefit of the assistance of a radiogram.

In this connection I believe the time will come when metropolitan hospitals will become so organized that fractures will be assigned to especially equipped wards under the care of surgeons who are particularly interested in the treatment of fractures.

Further, I believe it would be most advisable, both for the future welfare of the patient and also for the economy of employers, that they should

require that all fracture cases be sent to hospitals having x-ray equipments and extension apparatus and where skilled surgeons should treat them, rather than the company surgeons in their own homes.

(4) *Consolidation.* This period is subject to considerable variation, for the academic period stated in text-books cannot be depended upon, as experience proves that quite a percentage require additional time for complete consolidation.

It therefore happens that when the body weight is carried too early on the recovering femur, bending begins, and if continued, marked angulation and deformity occur.

Again, it is in just these cases that the radiogram is of so great assistance, for it comes to help us before it is too late.

(5) *Operation.* Recently sufficient evidence has been presented to definitely recommend operations by skilled hands for fractures of the femur in the cases where reduction is inadequate. Adequate reduction requires that the ends remain in apposition without obvious angulation or axial rotation, and that the shortening be not greater than $\frac{1}{2}$ inch.

Many surgeons who have had special experience in the treatment of fractures have learned to consider that certain kinds of fractures presenting characteristic radiographic evidence are best treated by operation. In these selected cases after the clinical diagnosis has been confirmed by a radiogram, then the decision is made to operate at once, for here, as elsewhere, operative methods to be successful must be efficient from the first.

"If a surgeon is doubtful whether he can treat a fracture efficiently by a non-operative method, he ought to consider whether he cannot do better by operating at once. He ought not to say, 'We can see what becomes of it and if it is not satisfactory we can operate later,' for by so doing the opportunity of getting a good functional result may be irretrievably lost."

The British Fracture Committee reported that when operation was too long delayed the prospects for good results were sacrificed.

In 147 cases in which primary operation was decided upon, good function was secured in 80 per cent. In 78 cases in which operation was resorted to only secondarily after failure of other treatment, good function was secured in only 60 per cent. In 83 cases in which operation was performed still later on account of malunion, good function followed in only 38 per cent.

The above statistics are corroborated by a series

of 37 cases of fracture of the femur collected by the writer.

In 10 cases of primary operation, good function resulted in 80 per cent.; whereas in 27 cases of secondary operation, good function was secured in only 60 per cent. However, the average of good functional results obtained by these operations was 65 per cent.; much in contrast with the 42 per cent. obtained by non-operative methods in the cases collected by the British Fracture Committee.

As both the American and English series of immediate operation were followed by good functional results in 80 per cent. of the cases, it is quite evident that the present results can certainly be improved from 35 per cent. to 50 per cent.

That delay in operating is very general, even among our own surgeons, is indicated from the fact that among 388 cases of operations collected from members of the American Surgical Association, only 78 cases, or 20 per cent., were operated upon immediately; 310 operations were performed only after other methods had failed.

Of these 388 cases of operations, 143, or 37 per cent., were for fractures of the femur. It is therefore certain that surgeons are favoring more and more operations for fractures of the femur. Results warrant the belief that operations are indicated upon the femur in fractures of the upper and lower thirds when the fragments are much displaced, as they frequently are, and in spiral fractures of the shaft, for it is just this class of cases which uniformly give the poorest results following non-operative treatment.

Finally, in the treatment of fractures of the femur many surgeons are now experiencing similarly unsatisfactory results, as they did fifteen years ago, when they postponed the time for operation in acute appendicitis and in gastric and duodenal ulcers with perforation. The same brilliant results that followed immediate operation in the above cases will likewise follow prompt operation in selected cases of fracture of the femur.

The number of operations will surely increase, but the larger number of fractures will be treated without operation, and the lesson to be constantly taught is *efficiency, efficiency* in every detail *from the hour of the accident*.

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CONCERNING MIXED TUMORS OF THE KIDNEY.

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There is perhaps no more interesting and fruitful field for the study of varied morphological tissue complexes, and for the investigation of the pathogenesis of neoplasms than that afforded by the so-called "mixed tumors" of the kidney. Birch-Hirschfeld was one of the first to call attention to the fact that, in the case of the testicle, the many combinations of mixed connective tissue and epithelial growths should all be thrown into a common group. So, also, was this author sponsor for a similar hypothesis in his classification of the remarkable admixtures of heterogeneous elements encountered in the mixed tumors of the kidney.

Although our knowledge of this subject has been considerably clarified through the work of Wilms and other authors, some of the mooted points in the origin of these tumors still require explanation, and it would seem, therefore, not amiss to report any observations tending to throw light on this interesting subject.

The hypothesis that these growths are the result of the development of rests of the Wolffian body has been suggested by many authors. Were it not for the presence of the striped muscle elements and cartilage as frequent and striking constituents—tissues that could not be derived from the Wolffian body—the theory would have the weight of embryological evidence in its favor. On the other hand, the close proximity of the Wolffian body and the testicularis in the fetus, makes the view of the existence of fusion of the two with inclusion into the kidney of the parts of the former, an enticing explanation.

When we recall that characteristic for the mixed tumors of the kidney is the simultaneous occurrence of two or more varieties of derivatives of the mesoderm, including smooth and striped muscle, cartilage, fat, elastic fibers, mesonephros, and fibrous connective tissue, together with the inclusion of certain epithelial elements, and when we remember that one of the elements constituting the Wolffian body is the paired testis, which is an embryonic rudiment of the middle coelom.

It is an undeniable fact, however, that the explainable elements of the embryonic mesoderm have their derivatives in the adult body, and that the testis, as well as the mesonephros, is a rudiment of the middle coelom. It is also a fact that the Wolffian body is a rudiment of the middle coelom, and that the testis is a rudiment of the middle coelom.

sclerotogenous layer (Sclerotom) of the mesodermal somites.

Let us keep in mind that practically all mixed tumors of the kidney are composed of various elements, amongst which are glandular tissue, smooth and striped muscles, cartilage, fat and elastic, myxomatous and fibrous connective tissue. For the production of such a complex, we must needs look for an embryonal tissue in which resides the potentiality of elaborating all these varied tissue types.

In order that this hypothesis may be clear, let us recall certain elementary, embryological facts in the development of the mesoderm and of the kidney.

For our purpose it will suffice to begin with that stage in which the development of the mesodermic somites and lateral plates occurs. From the mesoderm are formed two thickened bars of mesodermal

tains cells that undergo histological differentiation and are utilized in the formation of the cutaneous tissues, the connective tissues, smooth muscle and bone. From this mesenchyme, according to Hertwig, originates myxomatous, fibrillar, cartilaginous, osseous types of connective tissue, the lymphoid apparatus, smooth muscle and possibly even vessels and blood.

Later in development, we see the intermediate cell mass separated from the mesodermic somites and find it transformed into an elongated body, the primitive kidney (Fig. 2). We know that the Wolffian body, or mesonephros, is developed in this intermediate cell mass by the growth of a number of transversely arranged tubules.

Recapitulating, we note the myotome affording the possibility of origin of *striped muscle* fibers, the

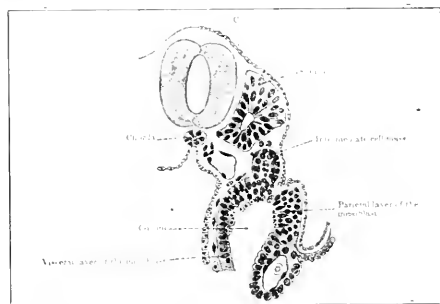


Fig. 1. Transverse section through the tenth pair of somites of the embryo, showing somite and intermediate cell mass (after Kollmann).

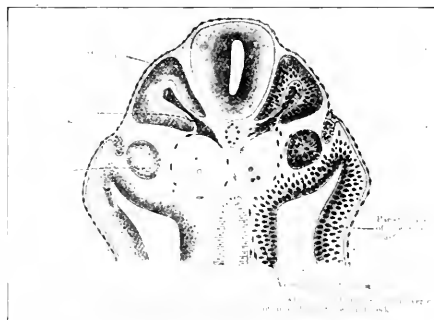


Fig. 2. Transverse section through the human embryo of the third week, showing myotome, mesenchyme, etc.

tissue, making the paraxial mesoderm, whilst the more laterally situated portions of the mesoderm are known as the lateral plates (Fig. 1). By division of the paraxial mesoderm, a series of cubical masses is produced, termed the *mesodermic somites*. Then a separation of the mesodermic somites and the lateral mesoderm presents itself through the appearance of furrows, the connecting strand of cells being known as the *intermediate cell mass* (Fig. 1).

Each mesodermal somite consists of numerous cells (myotome), arranged around a central cavity which soon disappears. The cells of the somites are gradually arranged into three sets, the *muscle plate* (myotome) (Fig. 2), the *sclerotogenous* (sclerotome) layer and the subepithelial or *cutaneous lamella*. The cells of the muscle plate layer lose their epithelial-like character and give rise to the striped muscle of the body. The sclerotogenous layer is responsible for many of the skeletal tissues, including, of course, the production of cartilage. The *cutaneous lamella* (mesenchyme) (Fig. 2), con-

sclerotome (sclerotogenous layer) for *cartilage*, the mesenchyme for the various types of *connective tissue*, including *smooth muscle* and *possibly vessels*, and the intermediate cell mass for the *glandular* or *epithelial* formations.

It would seem most probable that in the intermediate cell mass (Mittelpalte) in the myotome, and in the mesenchyme, all of which are in close proximity and relation in the embryo, must be sought the origin of the mixed tumors of the kidney.

The case to be reported is instructive in that it concerns a renal tumor containing only adipose tissue, fibrillar connective tissue, smooth muscle and vessels, a combination which is unique—as far as we know—and which still further supports Wilm's contention as to the origin of these growths.

In a kidney removed by one of us for calculi and hydronephrotic changes, a small tumor of the cortical substance was accidentally encountered, the gross and microscopic examination of which revealed the following:

tilage, elastic and fibrous tissue; age 11 years. Adenosarcoma with striped muscle, rich in glycogen; age 1 year (Wilms).

Case 8.—Adenomatous tumor, consisting of alveoli lined with cylindrical epithelium in a fine stroma of spindle cells; age 7 years (Döderlein, 1897).

Case 9.—Adenosarcoma, composed chiefly of round cells, but containing also spindle and epithelial cells, elastic fibers and smooth muscle; age 2½ years (Paul, 1886).

Case 10.—Vascular, round and spindle, celled sarcoma, containing epithelial lined tubules; age 9 months (Sturm, 1875).

Case 11.—Round and spindle celled sarcoma with adenomatous formations; age 8 years (Schmidt, 1892).

II. Myosarcomata with or without fat and striped muscle.

Case 12.—Bilateral myosarcoma, composed chiefly of bundles of striped muscle in a connective tissue framework, containing blood vessels and fat cells; age 1½ years (Cohnheim, 1875).

Case 13.—Bilateral myosarcoma; age 7 months (Cohnheim and Landsberger, 1877).

Cases 14, 15.—Rhabdomyosarcoma; age 2½ years. Myosarcoma; age 2¾ years (Heineke, 1897).

Case 16.—Myosarcoma, composed of striated muscle and a mixture of spindle and round cells; age 7 years (Bott, 1887).

Case 17.—Myosarcoma with embryonic striated muscle; age 1½ years (Heideman, 1893).

III. Round and spindle celled sarcomata, with or without striped muscle.

Case 18.—Spindle celled sarcoma containing striped muscle fibers; age 1 year (Eberth, 1872).

Case 19.—Small round celled sarcoma with considerable striped muscle, some fat cells and epithelial formations; age 6 months (Marchand).

Cases 20, 21.—Two cases of round celled sarcoma with striped muscle; age 19 months and 3½ years (Osler).

Case 22.—Polypoid spindle celled sarcoma with considerable quantity of striped muscle fibers and epithelial cells; age 4 years (Ribbert, 1886).

Case 23.—Round and spindle celled sarcoma in a myxomatous stroma, which had the chemical properties of mucin; age 2 years (Hanseman, 1894).

IV. Rhabdomyomata.

Case 24.—Rhabdomyoma; age 3¼ years (Hübert-Boström, 1879).

Cases 25-28.—Four cases of rhabdomyoma (Ribbert, 1892).

V. Teratomata and tumors containing adenomatous tissue, spindle cells, muscle and cartilage.

Case 29.—Teratoma composed of sarcoma cells, chiefly giant variety, striped muscle, layers of glycogen, small islands of cartilage and glandular structures (Manasse, 1896).

Case 30.—Embryonic connective tissue, striped muscle fibers without sarcolemma and adenomatous formations, which resembled most the collecting tubules of the kidney; age 3 years (Kocher, 1878).

Cases 31, 32.—Tumor composed of glandular epithelium, smooth and striated muscle, fibrous and elastic tissue; age 6 years. Tumor composed of fibrous and connective tissue, smooth and striped muscle, elastic tissue and cartilage (Wilms).

Case 33.—Round and spindle celled sarcoma, containing smooth muscle and islands of cartilage; age 18 years (Hoisholt, 1891).

Case 34.—Network of connective tissue, muscle and elastic fibers filled with small round, cuboidal and cylindrical cells. Fat cells present in isolated groups; age 3 years (Brosin, 1884).

Case 35.—Glands, smooth and striped muscle, elastic tissue, fat and connective tissue; age 3 years (Wilms).

VI. Round and spindle celled, and alveolar sarcomata.

Case 36.—Alveolar sarcoma with lung metastases; age 2½ years (Borchard, 1893).

Cases 37-40.—Four cases of round celled sarcoma; ages 2 years, 11 weeks, 21 months, and 11 years (Heineke, 1897).

TENDON TRANSPLANTATION.

Very ingenious methods have been devised for the attachment of tendons into the periosteum, as in boring a hole through the neck of the bone, as practiced by Jones; or by the employment of iron staples and wire, as advised by Codivilla. A great variety of arrangement may be used in transplanting the tendons. The peroneals may be transplanted to the inner side of the foot; the tibialis anticus may be transplanted to the outside of the foot; the tendo Achilles may be shortened, and the peroneal tendon or a part of the tibialis posticus may be transplanted into the tendon before it is sutured together. The external hallucis may be detached from its insertion and inserted into the neck of the first metatarsal bone, through a hole drilled in it. The semitendinosus in the thigh and the biceps, or the sartorius and the biceps, may be transplanted into the rectus tendon, or by the use of silk attached to the tubercle of the tibia.—JAMES K. YOUNG in *The Lancet-Clinic*.

piece of bony attachment to the new point of insertion.

(5) The results of one tendon transferred to another are less favorable as there is too great likelihood of stretching.

(6) The tendon should be dissected free for a considerable distance that its new course may begin as high as possible, and thus avoid working at an acute angle, that is its action must be made as nearly normal as possible.

(7) Silk seems to be the suture material of choice, although in many instances an absorbable suture is believed preferable.

(8) The member operated upon should be placed at rest in a slightly over-corrected position for at least six weeks, to prevent strain until the union is firm.

(9) Care in the practice of active motion should be then exercised and a convalescent splint be worn until muscular development in the new position becomes sufficient.

(10) In addition to tendon transplantation the production of arthrodesis is frequently of great assistance, thus partially stiffening the adjacent lax and insecure ankle joint.

In certain instances to overcome the deformity described as "drop-foot," silk ligament suspension instead of tendon transplantation may be advantageously employed. This method of treatment has been rather extensively used by Bradford, Ryerson, and others. The foot is suspended by heavy braided silk cords subcutaneously applied, extending from the tibia downward in front of the ankle to the bones of the foot. The operation is comparatively simple, but the technic must necessarily vary in each case according to the degree of deformity present. The silk is allowed to remain permanently in the tissues, and if the operation has been properly executed a favorable result may be confidently expected to accrue. It is always advisable to close the operative wound in two layers, i.e., suturing the subcutaneous soft tissues over the silk cords separately. A plaster dressing should be applied and permitted to remain for at least six weeks, after which no further external support will usually be required.

Talipes calcaneus, caused by paralysis of the calf muscles, is a disabling deformity which in the majority of instances may be corrected and a useful foot secured by an operation recommended by Whitman, *et al.*, a procedure which has given such universal satisfaction that it is adapted as a routine measure in all such cases, viz., astragalectomy, with posterior displacement of the foot at about five degrees equinus. The peroneus longus tendon is

divided about three inches from its insertion and dove-tailed through the tendo achilles, the ends being carefully sutured, thus reinforcing the foot in its backward position. A strong and serviceable foot which continues to develop may be thus secured.

Another deformity of frequent occurrence is paralytic equinovarus. If paralysis is too extensive to be benefited by transplantation, tendon fixation may be practiced as recommended by Gallie, of Toronto, the following technic being employed: A longitudinal three-inch incision is made over the external malleolus; the peroneal tendons are exposed and lifted from their sheaths; a two and a half inch periosteal incision is then made and the periosteum retracted; the bone is removed for the same length as the periosteal incision and the thickness of the tendon to be transplanted; the tendons are drawn taut and placed in this trough, the periosteum being carefully sutured over and to them. For this purpose chromic catgut is used. The tendons become firmly adherent and calcaneus is thus prevented. The patient is able to bear the body weight upon the ball of the foot, raising the heel from the ground, thus greatly improving the gait. The first operation of this character was performed about two years ago. Gallie reports 10 cases, the patients ranging in age from 2 to thirty years. The results obtained have been entirely satisfactory. Many other surgeons have reported favorable results from the Gallie operation.

For the correction of the deformity known as "clawfoot," which is usually the result of infantile paralysis, transplantation of the extensor proprius pollicis to the neck of the first metatarsal bone may be successfully practiced. In this deformity there is not only a marked shortening of the extensors but also the plantar fascia. After subcutaneous plantar fasciotomy a horseshoe incision of the dorsal foot surface is carried to the extensor tendon, and a flap containing all the tissues superficial to this is reflected upon the dorsal surface of the tarso-metatarsal articulation. The long extensor tendon is then detached from its phalange and transplanted into the neck of the metatarsal bone. In aggravated cases, if the deformity be not thus corrected, a wedge-shaped osteotomy through the dorsal surface of the metatarsal bone is recommended.

To illustrate the serious results which may accrue from clawfoot, the history of one case will be briefly related. The patient was a male of 35 years, the deformity having developed 12 years previously as a result of infantile paralysis. No treatment was instituted until he became unable to walk, and there was then extensive bony necrosis originating

brisk fire burning in the room, and even though the windows be open, the air will be warm. No home is too poor to be clean and no window too small to admit fresh air, if it be opened. I have often been called in council and found the patient still dressed in reeking underwear and at times a skirt in addition.

The vulva should be cleaned with soap and water and may be painted with tincture of iodine. It is a good procedure to shave the vulva. If a bath is given, the nurse must be careful not to allow the dirty water to run over the vulva into the vagina. Zweifel reports several cases of infection from this source.

The patient should be covered with a sterile, or at least clean, sheet; and not with a soiled blanket or comfort.

Sterile supplies, such as dressings, towels, gloves, sheets, catheters, tape, etc., are not difficult to obtain. In the city they can be obtained at a nominal cost from any good hospital; in the country every up-to-date physician has a sterilizer in his office and can sterilize his supplies with little effort. To go to a labor case without such preparation in view of the cost and ease of obtaining the same, is little short of criminal. And then the people appreciate it and are willing to pay for it. Some men will say that they do not do this and that they never had a case of puerperal sepsis. They are liars. Others will say that they never had a death from puerperal sepsis. There are some things that are worse than death. How about the morbidity? How about the one child marriages, the pus tubes, the pelvic inflammations and adhesions? How about the years of weary suffering and disappointment? Between morbidity and mortality there is little to choose in these cases.

We cannot have graduated trained nurses in all cases, but we certainly can teach the slovenly "experienced nurse" to wash her hands and be clean. Of course, we must cast the mote from our own eyes before we can ask her to remove the beam from hers. These nurses may object to this instruction, but if we explain to them how much *they* gain by it, they will appreciate our efforts. And how easy it is to teach the good sister or mother or friend of the patient to do all these things in a cleanly manner. But you must show them that *you* know what you are talking about or they will not appreciate the value of the efforts demanded.

In lecturing to the nurses at the Grant Hospital I have always impressed upon them that the most important article of an obstetrician's armamentarium is a good brush and a bar of soap. The brush

need not be fancy and the soap need not be patented or perfumed. A common rice straw brush and a bar of common soap will suffice. *The main prerequisite for the prevention of puerperal sepsis is clean hands.*

You should wear rubber gloves when handling the parturient woman. It is just as important at this time as it is in the operating room. It is malpractice, in these days of refinement, to attend labor without rubber gloves. Some will laugh at this statement and say they cannot feel anything with gloves. They must learn to feel with gloves. Perhaps you can conduct an aseptic labor without gloves, but why not use every aid to attain that object? Why refuse any single aid or modern refinement where so much is at stake? We know that God is patient and good, but why should you try His patience and risk your reputation and the life of a good woman who has placed her trust in you? The young fellow just from college will use them and the people will notice it. It is important that the hands be clean before applying the gloves and it is important that the gloves be kept clean after they are on the hands. It is ridiculous to see a doctor putting clean gloves upon dirty hands. Suppose the glove tears. It is just as foolish to immerse a dirty glove into a solution of bichloride of mercury and imagine it is sterile. A soiled glove must be cleansed with the same care as a soiled hand. And the same applies to the catheter. You do yourself an injustice when you use any old rag for a perineal pad to absorb the lochial discharge. A most useful bed covering for labor is the paper sheet sold by all dealers of physicians' supplies.

The use of sera to immunize against infection does no good. We must follow the principles of Crede and limit as far as possible the puerperal wounds and prevent the infection of necessary puerperal wounds. Every puerpera is a wounded woman. If it is good surgery to limit the operative wound and to avoid the injuring of the tissues, it is also good obstetrics. We must limit the number of internal examinations and make them gently and in a cleanly manner. It is important that all obstetricians learn to make diagnosis by external examination. About the only points indeterminate by external examination are the state of the cervix and the possible prolapse of the cord. The bag of waters should not be ruptured until the os is completely dilated, because the membranes dilate the cervix with the least trauma and also mechanically prevent the entrance of germs into the uterus. You must avoid all measures to shorten the time of

normal labor, as manual dilatation of the cervix, of the perineum, or having the woman bear down before the head is through the cervix. Do not give ergot until the placenta is delivered. Do not apply forceps until there is an honest scientific indication for their use. Pituitrin, scientifically used, is replacing forceps, and in Vienna they think that the use of this agent instead of forceps is reducing the morbidity and mortality of their clinics. Do not use douches, especially hot ones or antiseptic ones, in normal labor. They rob the vagina and the cervix of their epithelium and natural secretions. Prevent perineal and vaginal tears as far as possible, which means a patient conduct of the second stage; but do not allow the other extreme, or practice, and permit the head to pound for hours upon a rigid perineum until the vitality of the tissues is lost and they are bruised and infiltrated with blood. Early episiotomy and forceps are more scientific procedures.

The third stage should be conducted as physiologically as possible. Interference should be instituted only upon strict indication. Above all, do not attempt manual removal of the placenta unless there is profuse hemorrhage or it is pathologically adherent. Be very careful to obtain the placenta and membranes complete. Retained placenta makes splendid soil for the cultivation and growth of the vaginal bacteria and also prevent involution, which is itself a barrier to infection. The uterus should not be bruised by too early or too vigorous attempts at Crede expression of the placenta, or too much or too forcible massage of the uterus. In Vienna they never express the placenta unless there is bleeding; they leave it alone and allow it to come of its own accord. They say that this has helped to reduce the morbidity in that clinic. The placenta and membranes should be inspected to see that none is left in the uterus. It is the keystone of the treatment of the patient should fever arise subsequently. If a piece is missing it should be removed at the time of labor. If it is a large piece it is not necessary to go in for it. You must see that the uterus is free from blood clots, hard and fresh contracted, before you leave the house. I find that allowing the woman to get out of bed to the commode the next day after delivery allow blood clots to drop from the vagina and clots as a drain, thereby preventing to some extent infection.

Prevention of infection of the perineal and vaginal wounds consists in the scrupulous practice of asepsis and antiseptics and should consist of a technique most rigid in character and should be part of the very life and soul of the clinician.

I have not gone into the preparation and care of the patient before labor begins. I am taking it for granted that the cases with which we are to deal were partly normal when labor commenced.

If you have carried out the above program you should not have an infected case. If you do have the misfortune to have your patient infected, you must resort to the curative method.

The Curative Method is divided into: 1, local; 2, general; 3, specific; 4, surgical.

We are seldom able, at least in our own minds, to designate the original or specific focus from which the infection emanates. We must investigate the history of the labor, paying especial attention to the frequency of examination by vagina, the use of instruments or manipulation, the character of the third stage and the existence of lacerations. The temperature and the pulse must be studied. Very careful examination of the breasts, abdomen, and pelvis must be made and the relation of the condition of the alimentary tract to the general condition ascertained.

The treatment of puerperal sepsis has undergone many changes in recent years. The polyglot treatment of former years has given way to a more physiologic treatment; and we now rely more on aiding and stimulating nature's own methods of combating the disease. Nature has always been the best doctor for most diseases. When the general medical examination has excluded all other causes for illness and a diagnosis of puerperal sepsis has been made, the woman is isolated in the lightest, airiest room available, and put at complete mental rest, which means that a clean, pleasant, sensible obstetrical nurse is put in charge of her. A brisk cathartic is administered (salomel followed by salts or castor oil), and the patient put upon a generous semi-solid or fluid diet. If there be stitches in the cervix or perineum, they are removed at once to allow free drainage. The lacerated wounds and the vagina are swabbed with a rare mixture of iodine. Discharges are then awaited. It seems to be a general custom to give quinine at this stage of the disease, but I do not know why. I never saw it do anything of good and I do not see what it could.

Many to whom quinine is believed to be of aid and others to whom it is supposed to be harmful, the great majority are sure that there is something mysterious about it. Many quinine and others are not a strong brand, and therefore the action of there is in the quinine. I cannot tell the others. We must depend on the action of the quinine of the highest quality, sold by the best chemists, to mix with it. We must do this with care. We must

pay special attention to these matters and learn by experience and then we will have the requisite brains to form our judgment. DeLee and Merman report large numbers of cases treated by what they call a nihilistic or expectant treatment with wonderful results. I have seen many cases where severe illness was caused by active local treatment and in some cases death was caused by curettage, pelvic drainage, etc., intended for relief. The patient may be propped up in Fowler's position to aid drainage, but curettage, brushing out the uterus, packing, etc., are seldom employed by us at Grant Hospital. About the only indications for such treatment is hemorrhage from the uterus. If the woman does not show immediate improvement then we go further with our treatment.

The local treatment of infection is the attempt to remove the offending bacteria and their toxins, and their pabulum, clots, membranes, placental fragments, decidua—and to destroy those bacteria and neutralize those toxins which remain in the vaginal canal after the mechanical cleansing.

The idea is an excellent one, but this is a very dangerous procedure, even in the hands of an experienced obstetrician or surgeon. Under this head I wish to most strenuously decry the use of intra-uterine douches. They are most ineffectual because the bacteria are beyond reach fifteen minutes after they are inoculated. They are painful, sometimes violent uterine contractions being set up, and the fluid may escape through the tubes into the peritoneal cavity and a fatal peritonitis may occur. That the fluid can be forced through the tubes was amply proven some years ago in the service of Dr. J. F. Baldwin at the Grant Hospital. Some of you will say that they can be given carefully; that the douche bag should not be held too high; that you have often used these douches and have seen no harm. Who can tell the exact resistance of the tubes and the uterine walls in each and every case? Who can be sure that you or the nurse will hold the douche bag at the exact and proper height each time? If the greatest surgeons in the world are never sure of the consistency and resistance of the uterine wall, why should you tempt fate with such a dangerous procedure? You say you never had an accident; if you mean a death I may agree with you; but how about the morbid condition produced by your douches?

The nervous shock from these douches may cause syncope, convulsions, and even coma. The antiseptic may be directly poisonous, over fifty cases of bichloride and many cases of carbolic poisoning being on record. Air embolism, perforation of the

uterus, profuse hemorrhage, chills and fever from inoculation, sudden death from cardiac paralysis may result. The infection may be carried higher to uninfected parts. This protest against the intra-uterine douche must not be construed as inveighing against vaginal douches, as I believe in them *when specifically indicated*. Swabbing out the uterus with gauze wound around forceps and saturated with chemicals, or brushing the uterus, is deprecated by me.

Curettage or digital examination and removal of the uterine contents is recommended by many authorities here and abroad, among whom may be mentioned Williams, Hirst, Gallabin, Jellett, Sinclair, Chrobak, Schauta, Ahlfeld, Bar Pinard and Pestalozza. I use this method at times when I think it is indicated. You must be careful or you will do more harm than good.

Curettage was introduced in 1850 by Recamier, who invented the curet for this purpose. Some operators use a sharp and others a blunt curet. Some use it as a routine practice as soon as the fever disappears; others use it only if the finger fails to remove the particles from the uterus. Some repeat the operation once or oftener and some pack the uterus at the end of the operation. The principle exponent of this operation is McPherson of New York. Opposed to him are Williams, DeLee, Noble, Craigin, Edgar, Watkins, Ries, Bumm, Leopold, Fehling, Kronig, Veit, Ohlshausen, and others who formerly advised the operation.

I think that the curet is a very dangerous weapon at all times and especially at the puerperium. As I said before, it is an instrument that must be used with brains. I rarely curet in these cases of infection, but when I do, I assure you that I feel the great responsibility and danger of this operation more than when I operate upon a patient for any other condition. I do not believe, as do some of my more noted colleagues, that curettage is an operation to be performed by the general practitioner, especially in cases of puerperal sepsis. The delicate bank of leukocytes, the wall that nature throws up to limit the spread of the bacteria, is broken through, and the bacteria are literally ground into the lymph spaces and venous lumina. It is a thorough vaccination of the uterine tissues and resembles raking the soil after strewing it with seed. No matter how expertly done, curettage cannot remove all the diseased tissue. Perforation of the uterus is a common occurrence and causes fatal peritonitis. I have several times seen loops of bowel dragged down into the vagina. Hemorrhage may occur and cases of air embolism have been

in the past for the specific treatment of puerperal sepsis have failed. Under this head may be listed the silver preparations of Cr  d  , the mercury inunctions, and injection, the use of iodine, quinine and alcohol given intravenously and subcutaneously. Salt solution is a remedy that has been much lauded in the past for the treatment of all forms of infection. It is valuable but is far from being a panacea. The best method of administration is the drop method of Murphy. Care must be used in the intravenous use of salt solution; there is not only danger of air embolism but there is danger of overloading the circulation, causing pulmonary edema. It does not wash the toxins from the blood, as they are so bound onto the cells that only biochemic action can loosen them. The good effects of salt solution, when carefully and skilfully given are, that it stimulates the heart and kidneys, skin and intestines, relieving thirst and fatigue and promoting leukocytosis. Schauta of Vienna reports some success with the use of nuclein, but the results are not yet such as to justify its general use.

I have seen a number of cases treated with serum without any effect either for better or for worse. We might just as well have injected water and saved a whole lot of money. DeLee, in his large experience, has used all kinds of sera for 16 years, and says that he is positive that anti-streptococci serum does not cure a single case of streptococcal sepsis. Williams, Pryor, and Fry confirm these findings. Large numbers of cases have been treated by Bumm, Chrobak, Gordon and others and the reports are far from encouraging. In Vienna the use of sera has been abandoned and also in Munich. Our experience at the Grant Hospital has taught us that their use is absolutely futile. Tetanus serum has been found useful when indicated but the anti-streptococcal serum is useless. The reason for this is obvious to those who are working along the lines of immunity and hence I will not take the time to discuss it here.

DeLee, Williams, Cragin and Newell have found the results of vaccine therapy in puerperal infections to be negative. I do not feel that there is at present much to be gained by the use of vaccines in this condition. I think that we had one case in our hospital where vaccines were used with apparent good result. But our experience is too limited to speak with any degree of authority. Dr. Shilling is constantly working on this subject in our laboratories, and may report something of interest later. It is generally admitted that in acute puerperal sepsis vaccine therapy is useless and may be harmful. The abscess of fixation, once in a while heard of, has been lost in the march of progress.

Surgical Treatment. Little need be said about the surgical treatment of puerperal sepsis other than has already been discussed in the preceding chapters of this paper. The treatment of pelvic inflammations by operation in this condition is no different than in any other. No real difference of opinion exists regarding the procedures advocated for the treatment of localized suppurations. Two radical operations have been employed in the treatment of severe infections and there is much to learn about both of these. One is extirpation of the uterus and the other is ligation of the pelvic veins, with the view of stopping the progress of a thrombophlebitis. Total hysterectomy has been done several hundred times, but without enough success to give it a firm place in our therapy. Most of the authorities whom I have consulted admit the following indications for hysterectomy. In all of these the local lesion is the predominate factor. They are rupture of the uterus or vagina with infection, perforation of the uterus with peritonitis, or perforation of the uterus during local treatment of an infection within it; the infection of a fibroid, or when a fibroid has been much bruised by an operative delivery and infection is feared; cancer of the uterus (I saw one such case in a woman who was six months pregnant); infection with molar pregnancy; abnormal adherence of the placenta with infection; uterine abscess; gangrene of the uterus.

The greatest danger is from peritonitis due to soiling the peritoneum during removal of the uterus. Much uncertainty exists as to the propriety of removing the uterus in cases of bacteremia, or at least in cases of severe endometritis and uterine lymphangitis, when the infection, presumably, is still more or less limited to the uterus. Experience has shown, says DeLee, that uteri are usually removed too late, to do any good, and in those cases where the courageous operator has removed the uterus early, he could never be sure that the operation was necessary. The operation may have killed her, or, if she got well, may not have contributed to her recovery, and has rendered her sterile. I have seen cases where I felt that the operation really saved a life. Williams, Lea and Edgar contend that no one would expect any good to result where a general bacteremia exists and I agree with their views. Septic patients are the very poorest subjects for operation and anesthetics and great care should be exercised in the selection of subjects for this operation.

The operation for ligating the pelvic veins is still in its infancy. It is a formidable operation and the results are so far from satisfactory that even the

CYSTOSCOPY IN THE FEMALE.

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It is now twenty years since Howard A. Kelly published the description of a method of urethral, bladder, and ureteral exploration according to definite principles, and with certainty and comparative ease. For many decades before investigation along the line of bladder research of the boldest and most heroic kind had been carried on by zealous workers, but in the light of our present knowledge, the names of Howard A. Kelly and Max Nitze stand out above all the rest. As the electric instrument of Nitze enabled us to view with precision the hitherto unexplored bladder cavity in the living, so did the instruments of Kelly, coupled with the posture and reflected light, open this field to us for study and investigation in the female, limitless in scope and most promising in results, particularly so far as diagnosis and treatment were concerned.

Strange as it may seem to those unfamiliar with the actual technic of this method, it is, after all, easy of execution, the only requirements being the few instruments of simple construction, the distension of the bladder with air by the particular posture called by Kelly the "knee-breast position," and careful attention to asepsis and avoidance of trauma to mucus lining of organs concerned in the examination. The details of the cystoscopic technic of Kelly are known to everyone; but the appreciation of the ease and at the same time the value of the procedure have unfortunately reached comparatively few men in the surgical and urological profession. The urologist is concerned apparently with the more difficult and more serious affections of the male urinary organs, and is content with the application of his technic to the investigations in the female. Now does not this seem more than strange, inasmuch as the ordinary cystoscopy applied to the female fails in several most important features, among which are, first, the direct observation of every part and lesion of the bladder, urethra, ureteral meatuses, and interior of the bladder; and, second, the ease with which topical treatments can be applied, the ureters catheterized, foreign bodies removed, and most minute descriptions of pathological states recorded?

As to the best means of exploring the bladder in women, it can be said that there are but two methods of choice: first, the cystoscopy of Nitze, or its modifications, with water as a medium for distension; second, the reflected light with Kelly's cystoscope, with air as a medium. The former is much easier to perform; the difficulties encountered in the

procedure in the male are not met with; one can use a long or short instrument, and the patient, as a rule, resists less; but in the thorough examination of the interior many difficulties are encountered. It will suffice to briefly review a few of these difficulties:

(A) The painful bladder in women will not yield to water distension as kindly as the male bladder, and the patient becomes extremely restless and nervous, thus requiring a general anesthetic, or, she is unable to retain the fluid, with the disturbing consequences incidental to bladder contraction, and variation in quantity of fluid retained.

(B) The landmarks in the female bladder when it is distended with fluid are so few that if there exists either a distortion because of pelvic tumors, swellings, deflections from adhesions, or displacements, one will easily become confused unless he is fortunate enough to have an uncomplainingly submissive patient, which is the exception rather than the rule.

(C) The urine cloudy from pus or blood, as, in the case of cystoscopy in the male, often so blurs the visual field that the examination has to be abandoned to be repeated later.

(D) As inflammation and ulceration may be presented in large or small patches, thus giving the bladder an angry red, beefy appearance, it is very apparent with what difficulty one would come to any definite conclusion as to pathology, or with what limited success one would find the ureteral orifices, should such a pathology exist in their vicinity.

(E) To view the entire cavity of the female bladder with the water medium with such care and precision as to inspect every portion with the lens close enough to the part to thoroughly identify it, even in a bladder not markedly pathologic, and to detect even minute lesions, such as fissures or ulcers, is impossible to anyone except a master of marvelously skillful technic, if for no reasons other than the mechanical difficulties in the way, or, because of the necessary pain and discomfort arising from the manipulations.

(F) Presuming that many of these difficulties can be overcome in any one given case with the Nitze cystoscope—though of course in a series of cases they must be presented as obstacles here and there—presuming that one has succeeded in inspecting the interior of the bladder, in making a diagnosis of, say, ulcer or foreign body, one can readily see the difficulties presented either in the way of topical treatments or in the easy and rapid removal of a foreign body.

fiery redness. A few topical applications to the urethra subsequent to her recovery from operation sufficed to give entire relief.

CASE II:—Mrs. G., age 19; married fourteen months. No history of pregnancy. On March 30, 1914, began to complain of an irritability of the bladder. Urine passed frequently and freely with some burning at the end of the act of micturition. A careful gynecological examination revealed the pelvic organs apparently normal, rectum normal, and no pathological findings on the exterior genito-urinary organs. The urine analysis was absolutely negative; no excessive acidity, pus or leucocytes being found. Cystoscopy: Bladder mucosa normal; ureteral orifices easily found and normal, but the trigone was intensely hyperemic and quite painful to the touch. The urethra was redder than normal, but not pathologic. A few topical applications of weak silver solution through the Kelly cystoscope brought on a disappearance of the symptoms.

CASE III:—Mrs. E. T., age 24. This case will serve to illustrate ulcerative cystitis as well as foreign body removal. The patient was operated upon in 1905 for acute appendicitis; after her recovery she began to pass blood from the bladder, and complained of considerable pain on urinating. She has always been very much of a neurotic, and the history of her case is rather thrilling, even before I first saw her in 1910. She had a nephropexy performed on her right side in 1905, two months following the operation for appendicitis; a gall-bladder drainage and stomach exploration in 1909; the wound failed to heal, so the abdominal scar was removed and the wound resutured in 1910, and in July, 1914, the climax in the way of operations was reached when a surgeon finally removed her tubes and ovaries through an abdominal incision. During her early visits to me in 1910, when she was being treated for a tubal infection of some sort, my attention was called to the condition of her urine, which was found to be bloody, purulent, offensive in odor, sometimes alkaline, sometimes acid, but always attended by severe pain in voiding. An occasional irrigation followed by the instillation of some weak silver solution, always gave her some relief, only to be followed by symptoms just as severe as before.

On December 3, 1910, I prevailed upon her to submit to a cystoscopy under an anesthetic. A bit of glass catheter 3 c. m. long was discovered in the bladder and removed with ease. (It might also be of interest to record here that on May 31, 1910, during a vaginal examination several pieces of glass from an irrigating tube were removed from the vaginal canal. No definite history of how they happened to be there could be obtained, but she had had several vaginal douches at one of our hospitals where the glass irrigating tube was used.)

The symptoms were not relieved, however, and she returned for another cystoscopy in September, 1913. This was done in the knee-breast position by the Kelly method. The ureters were catheterized with ease; the urine from each side was perfectly normal, the urethra dilated very readily and distension was extremely satisfactory. The bladder

showed a uniform redness of inflammation seen in a diffuse cystitis, but no ulceration except over the trigone and around the internal ureteral meatuses, where there was found a number of small ulcers, like cut out patches, very painful to the touch. The urethra was intensely inflamed. Near the posterior pole, about 2 c. m., below it on a vertical line, was seen a bit of glass tubing (a piece of catheter) with the free end rounded, the other end having penetrated the bladder wall for a distance of probably 3 m.m., and held firmly in place by its depth of penetration. In a few seconds this was removed with alligator forceps, and one can easily imagine the relief following.

The bladder recovered its tone and color, the ulcers nearly all disappeared, but there were still present in this case a few symptoms suggestive of the presence of some foreign body. Both the electric cystoscope and the Kelly method failed to demonstrate anything further, but on September 14, 1914, another cystoscopy by means of the electric instrument revealed the presence of another piece of glass catheter about 2 c.m. long at the base of the bladder on the trigone within the urethrovaginal fold. She was placed in the extreme lithotomy position, the bladder was distended with air, and the glass was removed in two pieces, together with several others, by means of the alligator forceps and the Kelly cystoscope.

The ease with which the case has been treated topically and the exactness with which the patches of ulceration could be located, recorded and observed in their healing compels me to emphasize and recommend the air method of cystoscopy in cases similar to this one.

CASE IV, indicates simply the value of the procedure as a routine measure in diagnosis: Mrs. B. came to me after she had been under the care of two physicians, one of whom recommended an exploratory laparotomy and the other had not made a diagnosis, but had been prescribing for her. The history briefly was that she had been having, for the past few months, a pain in the right loin, more especially in front and along the right ureter; same pain in the right lumbar region, and but very little disturbance in urination; she had lost a little weight and occasionally had fever. No history of a renal colic was obtainable. The catheterized urine from the bladder was slightly cloudy, acid in reaction, and contained a few pus cells and a very slight trace of albumen. (Observe the acid pyuria.) Cystoscopy revealed absence of cystitis; the trigone slightly congested; ureters found with ease; right ureteral opening somewhat reddened; catheterization of the ureters by the Kelly method showed the left urine perfectly normal; the right contained much pus and dead epithelium; no bacteria could be demonstrated. While a diagnosis scientifically exact has not yet been made, the patient being very unreliable and irregular in her reports for examination, yet one can readily conclude as to the great value of the information thus far obtained.

CASE V, is simply to demonstrate the value of the

October 11. 8 A. M., slept at intervals during the night, somewhat restless; pulse regular, fair volume. Abdomen still distended. 11 A. M., takes nourishment well. 4 P. M., retains nourishment. 7 P. M., small amount of feces and flatus from enema, unable to retain enemas, three involuntary evacuations. Total fluids, 46 ounces retained without vomiting.

October 12. 10.15 A. M., three grains of calomel given. 1 P. M., vomited small amount of green

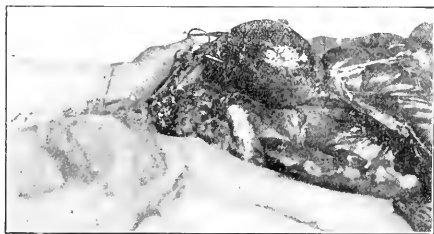


Fig. 2.

fluid. Total fluids, 40 ounces. 9 P. M., patient tossing about, noisy. 9.55 P. M., morphine.

October 13. 8 A. M., face pale, appears weak. 10.30, vomited three ounces of brown fluid without fecal odor. 11, small amount of flatus expelled with enema. Two involuntary evacuations during the night. 11.25, compound enema, return a small amount of fecal matter and flatus. Total fluids, 26 ounces. Notes by interne: Vomiting more frequent since admission and without effort. Calls out at



Fig. 3. Right side of chest has been removed.

times as though in considerable pain. Abdomen more distended. No rigidity. Incontinence of urine. Rectal examination shows external hemorrhoids, but no obstruction felt low down. Prostate small.

October 14. 8 A. M., complains of severe headache and abdominal pain. Abdomen remains markedly distended. 10.30, vomited three ounces of brown fluid. 4 P. M., one ounce of castor oil. Total fluids, 37 ounces.

October 15. 8 A. M., face pale, lips dry, pulse irregular, rapid. Abdomen very tense, irrational. 9.30, vomited four ounces of curdled milk. 10,

vomited a large amount of thick brown fluid, fecal odor. 11, lavage ice only. High colonic irrigation resulted in return of small amount of feces and flatus. 12, patient appears weaker, noisy. 2 P. M., expired.

Urine, Oct. 10—Alkaline, 1018, no albumen or sugar.

Blood—19,720 leucocytes. 83% polynuclears; 13% large and small mononuclears; 1% transitionals.

Temperature record, October 10—100°, pulse 120, respirations 24. October 11—Pulse 84 to 100, October 12—Temperature 101°, pulse 100. Thereafter until death temperature slightly above 99°. Pulse between 90 and 100; just before death 110.

EXTRACTS FROM THE AUTOPSY RECORD.

On opening the abdomen subcutaneous fat is found to measure about 1.5 cm. in thickness. It is of a yellowish color. Great omentum not seen on opening abdominal cavity. The intestines are

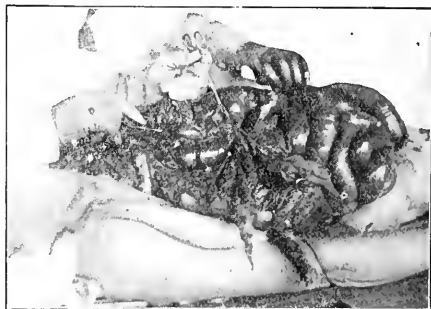


Fig. 4.—Sac opened.

greatly distended and covered with a plastic exudate. The blood vessels in the parietal peritoneum are distinctly injected. The parietal peritoneum on the right side, four fingers breadths below the umbilicus, shows a triangular patch of plastic exudate which measures $2\frac{1}{2} \times 1$ cm. This patch corresponds to a similar one present in a loop of the small intestines. This was separated without much difficulty.

The large intestine was found to be tremendously dilated. It was traced upward to the diaphragm, where it seemed to be constricted. The intestines in the pelvic region were gangrenous and at several places perforations had occurred. Fecal matter was found in the pelvis and also near the spleen. Small and large intestines show post-mortem changes. Both are enormously dilated, the small throughout, the large to the middle of the transverse colon. In the cecum are small ulcers averaging a half-inch in width. They seem to be limited to the mucosa. There are multiple perforations in the sigmoid.

Rectum—Appeared normal, except for hemorrhoids at the anal opening.

Gall-bladder was tinged with green and contained no stones.

APPENDIX VERIFORMIS OF LARGE SIZE. REPORT OF CASE.*

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Any unusual pathological specimen, such as this appendix, is probably worthy of record.

J. E., male, cigarmaker, age 54 years, height 5 feet 7 inches, weight 220 pounds, came to me February 14, 1914. He had been in good health and had no reason to consult a physician since boyhood, except for fracture of the ribs three years ago.

The present trouble began about the middle of last November. Since then he had more or less pain in the lower right quadrant of the abdomen extending down into the groin. The pain was most intense just above Poupart's ligament and was worse at times. There had been no chill, but at times he felt cold. He had worked every day. His suffering had recently become worse and the pain for the last few days was intense. There had been no vomiting, but at times there was nausea.

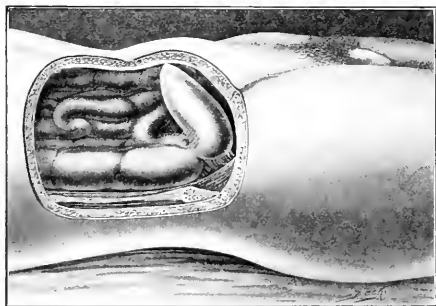


Fig. 1.

The man was stockily built, robust in appearance and of ruddy color. He had a corpulent abdomen. There was no distension or local swelling, but there was slight rigidity of the right rectus muscle. There was no tenderness except over a mass that could be plainly felt midway between the umbilicus and the brim of the pelvis, about the size of an orange and movable, but very tender. The abdomen was otherwise negative. Temperature 100°; pulse 100.

I operated upon the patient the following morning. Upon opening the peritoneum I found a pearly-white mass about the size of a pear, apex upward and slightly adherent to the anterior abdominal wall, wherefrom it was easily torn loose. It was movable except where it was attached to the posterior abdominal wall for one and a half inches. It occupied the correct position for the appendix, which, indeed, it proved to be. Cut No. 1 shows its relative position in the abdominal cavity. Upon relieving the posterior adhesions, the cecum was brought forward and the appendix detached in the

regular way. The attachment to the cecum was larger than usual, being one inch across.

After removing the appendix the cavity was drained in the usual manner. The patient made the usual recovery for a drainage case.

The appendix when removed (see cut No. 2) presented a pear-shaped, pearly-white mass, bent upward upon itself at nearly a right angle and with a well-defined mesoappendix, with a decidedly soft, fluctuating portion at the apex for about one-half inch at the part attached to the anterior abdominal wall. The lumen was dilated and the walls were hypertrophied to about a quarter of an inch in thickness. It measured 6 inches in length and 2½ inches in diameter and 6¾ inches in circumference at the center. The exterior was smooth and glossy and solid. It was densely filled with a grey-colored muco-purulent, gelatinous material.



Fig. 2.

Dr. Francis A. Hulst had the following to say about the microscopical section of this specimen:

"The tissue consists of inflammatory exudate of the subacute type, involving the various walls, all of which are distinctly defined except the mucosa, which was probably not well fixed because of the fixation of the organ in mass. The specimen shows the lymph in the submucosa as usually found in the appendix.

"The contents consisted of debris and broken-down tissue, and pus cultures therefrom were negative, probably because of the formalin solution in which the specimen had been suspended. This is not a cyst of the appendix, but an infection of an hypertrophied appendix."

The case here recorded is, then, a straightforward one of appendicitis, with an appendix, not cystic, but of great size.

The largest appendix I can find recorded in the literature is one presented by F. Grauer, of New York City, to the Northwestern Medical and Sur-

*Read before the Brooklyn Pathological Society, May 14, 1914.

gical Society in 1890. It measured 12 1/2 inches in length; no mention was made of its width.

W. F. Howard reported a case in *Northwestern Medicine*, Vol. 4, No. 4, April, 1912. The appendix when removed was 5 inches long, 3 1/2 inches in circumference near the distended apex, 1 1/2 inches at the middle, where there was a torsion and constriction, and still smaller, about 1 inch, in circumference at the base, and was filled with a thick, purulent liquid matter.

Under date of April 13, 1914, George Brewer, of New York City, wrote to me:

"The largest appendix I ever saw measured 11 inches in length, extending well over into the left iliac fossa." He does not mention the diameter.

John B. Murphy, of Chicago, in a recent letter, referred me to Vol. 6 of Keen's Surgery, where I found under his name the following:

"In original article, Vol. 4, the length of the appendix was given from 1 to 9 1/2 inches. To this may be added a case reported by A. Patel, measuring 10 inches. It was peculiarly shaped at the base, was nearly the same diameter as the ileum, then gradually narrowed until about the middle, where it was of the usual size, resembling the elongation of the cecum in canines."

Prof. George Huntington, of Columbia University, under date of May 14th, says:

"The largest appendix in our collection measures 24 1/2 centimeters; the shortest one-half of a centimeter."

398 FRANKLIN AVENUE.

PASSIVE MOVEMENTS IN SPRAINS.

We are constantly hearing and reading about gentle passive motion in sprains. On what theory this advice is based it is hard to conceive by those of us who are constantly being called to treat the injurious effects of such procedures. Certainly we know that a sprained joint can be immobilized too long, but we also know that there is an a ute stage even in a simple sprain when rest is the treatment, and especially is this true, as the sprain is accompanied always by a stretching of the tendons, capsules and ligaments and more or less synovitis; and many times, and perhaps always, there is not only stretching, but also rupturing and tearing of the structures mentioned above. How often do we see in sprains of the shoulder, after a few days at most, passive motion begin, and later, as the shoulder becomes more and more painfully stiff, futile passive motion under an anesthetic, "to break up the adhesions," until the patient himself discovers, as he states, that the shoulder is getting worse and more stiff after each manipulation?—ARTHUR J. GILLETTE in the *J. A. M. A.*

HOW SHOULD THE SURGEON BE GOWNED IN THE OPERATING ROOM?

FRANCIS REED, M.D.,
ST. LOUIS, MO.

"Will some one please wipe my face?" This is an expression from a surgeon at work that can frequently be heard in an operating room. There are times when a surgeon has good cause for having beads of perspiration upon his forehead, and it need not be during the hot summer time, either. It is very annoying to the surgeon to have his face bathed in perspiration while at work. He is unable to continue until his face is wiped. This means an interruption and often aggravation, because it is



very seldom that a face is wiped properly or satisfactorily. Especially is this true when a surgeon is compelled to wear glasses. Not very long ago my sympathy went out to a surgeon whom I saw at work on a common bile duct operation. He had gotten into a tight place and the beads of perspiration were pouring off his face. Two nurses were kept busy, one on each side of the surgeon, wiping his face. It was an ordeal for him and his facial expression gave evidence of it.

While thus extending my silent sympathy to the surgeon, the thought of a surgeon's comfort while at work occurred to me. Really, when one considers the great amount of surgery that is being done, there are but very few, I repeat, who are properly gowned for the operating room.

Before giving my version of a proper attire for the surgeon in the operating room, an expression of condemnation is registered of him who operates in his undershirt. This is a bare facility, a surgical

sin. At no time should the operator be more clean, more emaculate in his appearance, than when he steps up to the operating table.

What is the proper garb for a surgeon? Let us enumerate the necessary parts for his attire: For the head a piece of gauze, not less than six thicknesses, with a width of about four inches, long enough to encircle the head. This gauze bandage covers the forehead and should reach to the eyebrows. A similar gauze bandage is applied in a manner to cover chin, mouth (and nose if so desired) and the cheeks; it is secured on top of the head. Upon the head is then placed an operating room cap. This covers up the hair. From the illustration it will be seen that very little of the face is exposed. The dressing is not as hot as it appears. It is comfortable. The gauze bandages are thick enough to absorb all perspiration so that there is no need of any wiping—the face feels quite dry. This face dressing is best applied by the surgeon himself, as he can better adjust it to his comfort than a nurse. For the body, a medium heavy shirt of a cotton fabric (a basket weave is admirably suited to absorb perspiration), duck trousers and duck shoes (tennis shoes with white rubber soles), constitute an attire that is beyond criticism. These articles of dress, excepting the shoes, should be surgically clean, i. e., next to being sterile. The clothes are worn next to the skin, all other clothing (undergarments) having been removed.

In this garb the operator prepares his hands and arms for his surgical work. Having finished with this process, he proceeds to don his sterile operating room gown with the assistance of a nurse. It should be of a medium weight cotton fabric. The fabric known as "galatea" is a very desirable one. The gown should fit comfortably and have a length that reaches to the ankles. Its sleeves should extend to the wrist so that the operator may experience no difficulty in putting on his rubber gloves.

As a precaution and additional safeguard, it has been my custom to wear a pair of sterile bags or mittens over my gloved hands while the patient is being prepared for operation. These mittens are very loose and reach up to the elbow. They are made of medium heavy duck, which gives them a certain amount of stiffness, thus facilitating the placing of the gloved hands into them.

Some surgeons wrap a towel moistened with a 1:5000 bichloride solution, or with a normal salt solution, about their hands. This answers the same purpose, that of an auxiliary protection, while the final preparation of the patient is made. My preference is given to the mittens on account of their sim-

ilarity and their perfect protection. The idea was adopted by me after having seen Dr. Franklin Brady, Surgeon to the Roosevelt Hospital, in Philadelphia, wear them.

EMPYEMA THORACIS IN CHILDREN.

It should be a cardinal rule that as soon as we recognize the presence of pus in the pleural cavity, it should be evacuated at the earliest opportunity. Success in treatment depends largely upon its early removal, and if we can secure good drainage and keep the cavity free from sepsis, the risks of complications occurring are greatly diminished. I believe that the earlier the evacuation of the chest takes place the less chance is there of the development of purulent pericarditis and meningitis, which I consider are in the main due to the long continuance of pus in the pleural cavity. In most cases any attempt to relieve the effusion by aspiration is a dangerous waste of time, and is by no means an efficient method of treatment, but there are exceptions to this rule. In cases where the exploring syringe has drawn off turbid serum—by which I mean serum charged with pus cells—I have frequently aspirated with excellent results. Then, again, it should be tried in very young infants who are unable to stand a serious operation. Aspiration is also useful when the effusion is very large. It may in such cases be had recourse to on the day previous to incision, so as to avoid the danger of syncope due to the sudden evacuation of a large quantity of fluid. In small localized collections of pus it is also recommended, but I have had no experience in such cases. The objections to aspiration are that by this means we cannot remove all the pus, that large masses of fibrin are left; we get no drainage, and have generally to resort to other measures later. As a rule our choice lies between resection of a portion of rib and simple incision of the pleura, and there are points in favor of each method. By the excision of a portion of rib we undoubtedly get better drainage and less risk of sepsis, but, on the other hand, it is a more serious operation, takes longer time, and causes greater shock. Incision of the pleura is a very simple and easily performed operation, is followed by little shock, and the drainage is usually sufficient.—H. G. M. DUNLOP in the *Edinburgh Medical Journal*.

Unconscious patients should be catheterized at regular intervals of about eight hours.

cent. the mortality of warfare approaches, the less will be the enthusiasm for its "glories." If the mortality could be brought up to one hundred per cent. the problem would be solved, and war would cease. Do the activities of the surgeon of the Red Cross make for the abolition of war or for its perpetuation?

If the man of fighting age refused to go to war, or if he was proclaimed the hero who had moral courage enough to stay at home and do his work and refuse to participate in the miserable business, then the problem would be solved. Do the activities of the Red Cross surgeon, who rushes blithely to the front to keep alive this "sport of kings," make for war or for peace?

History may contemplate with amazement the white-robed surgeon attempting to save, while about him are murderous men, with all of the appliances of science, bent upon destroying lives—all zealously working together. Perhaps society will some day look back with wonder upon the anachronism of the skilful surgeon, with his infinite possibilities for human service, laboring day and night to restore to efficiency the butchers of men, that they may be returned to their cruel pursuit.

War is something more than hell. It is the crucible in which a social system is tested and found to be dross.

Let the participating surgeon not lay upon his soul the unction that he is a noncombatant and inspired only by his love of humanity. We should not be deceived. He is a part of the program of war. When it is over, we shall find him parading among its "heroes," and bidding for the recognition which is accorded to those who went forth to kill.

Were the impelling motive, behind the sentimental neutral, one of love for humanity and a burning zeal to sacrifice himself for mankind, there are ample fields yet unoccupied in the industrial struggle in every land. In our own country the preventable deaths in the economic warfare for livelihood and for profits are quite as appalling to the discerning eye as those of the European carnage. Here are the unaided hurt crying for help—hurt by machines and dust and poisons and rotten railroad ties and insufficient food and crowded slums—all because somebody is making money by withholding rightful human protection from them and robbing others of the wealth that they create. These suffering and dying millions go down to their graves without the stain of their fellows' blood upon their hands. They are soldiers in the world's warfare against the forces of nature, enlisted to

make the world more pleasant and life more livable, they stand for life, and not for death, they need all the surgeons, nurses, Red Cross stockings, and shirts that are now consumed by the blood-thirsty men who go forth to slay the husbands of innocent wives and the sons of guiltless mothers and the fathers of weeping babes.

Here is the answer to this social riddle: War is a ruling-class game. It is the affair of Kings, ministers, imperialists, and the capitalistic seekers for markets and economic aggrandizement. The Red Cross surgeon prefers the approval and applause of this so-called "upper class." The exploited poor in the industrial struggle have nothing to offer him but a doubtful gratitude. To give himself to them and their cause with the abandon that he can give himself to the cause of war would mean also to court the disapproval of those who have the wealth and "honors" to bestow.

There is no neutrality in war. All who are parties to it are warriors—the surgeon no less than the blood-lusting dupe of the military insanity.—JAMES P. WARBASSE.

ADDITIONS TO THE EDITORIAL STAFF OF THE ANESTHESIA SUPPLEMENT.

Pursuant to its policy of *service*, the SUPPLEMENT OF ANESTHESIA AND ANALGESIA of the AMERICAN JOURNAL OF SURGERY announces the acquisition of some important associates to its international editorial staff, among whom may be notably mentioned such authorities as Prof. Charles Baskerville, Prof. Dr. Guido Fisher, Dr. Edward H. Embly and Dr. Torrance-Thomson.

Prof. Charles Baskerville, Ph.D., F.C.S., is Professor of Chemistry and Director of Laboratories in the College of the City of New York, and is renowned as one of the world's most noted experts on the chemistry of anesthetic agents. He recently collaborated in the preparation of Gwathmey's monumental American volume on "Anesthesia." Prof. Baskerville is at present completing some original researches, and the SUPPLEMENT expects to publish his results in the near future.

Prof. Dr. Guido Fisher is Director of the Royal Dental Institute of the University of Marburg, Germany, and the author of "Local Anesthesia for Dentistry," translated for American readers by Prof. Richard Reithmüller of the University of Pennsylvania. Prof. Fisher has been signally honored, during a recent visit, by the entire dental profession of the United States, and his co-operation as an associate editor will be appreciated by all those who are vitally interested in conductive and

Surgical Sociology

Ira S. Wile, M. D., Department Editor.

THE 48-HOUR WEEK FOR NURSES.

In the reorganization of industrial society the labor union has played an important part. With the desire to promote the welfare of workers there has been great activity in securing legislation insuring shorter hours of labor, restricting the time and place of labor of women, and generally safeguarding the physical welfare of industrial workers of both sexes.

In the course of progress for social betterment there are undoubtedly types of legislation which when carried to their logical conclusion would result to the disadvantage of the state. For example, an eight-hour day law would hardly be practicable if forced upon the liberal professions. Professional life is largely distinguished from mere industrial duties by the large element of personal service entering into it. The restriction of hours of service for physicians would be almost a *reductio ad absurdum* of legislation in behalf of the restriction of hours of labor.

For many years nursing has been regarded in the light of a profession for women, and it appears strange to find legislation undermining the high standard of nursing by classing it as a type of labor which might well be restricted to a forty-eight-hour week. As a factor in lowering the efficiency of the nursing profession, union legislation of the type indicated is distinctly disadvantageous.

In New York State the registered nurse has assumed a higher professional standing than in many states of the Union. The nurses themselves have sought legislation to prevent the use of the word nurse by any persons save those duly qualified and licensed under the State Registration Act. It appears inconsistent to seek for the passage of laws modeled after the one enacted in California, but the State of Washington is contemplating the enactment of one restricting the hours of nurses so that it will apply not only to pupil nurses in hospitals but to graduate nurses in private practice.

The eight-hour law of California provides for the limitation of the work of pupil nurses to forty-eight hours a week. As originally drawn, the bill sought to include the graduate nurse, but, fortunately, the professional status of the graduate nurse was established and she was not condemned to suffer a restriction of her personal freedom. The California bill became a law June 14, 1913, since which time the hospitals of that state have been struggling with the administrative problems of giving adequate training to pupil nurses, limiting their payrolls, and maintaining adequate care for their patients without recourse to special nurses.

From the practical side of the question, the forty-eight-hour week has failed to provide adequate time for the instruction of pupil nurses. There

have been distinct limitations in the field of experience. Incidentally, inasmuch as this law is applicable to all women except graduate nurses, even the dietitians and the women internes come within its provisions. As a result of the restrictions of time, the training, experience, and executive work of pupil nurses are particularly curtailed and nurses are not properly fitted to take up executive work and special nursing. Furthermore, nursing in the special branches receives decreased attention with the result that the graduate pupil nurse is not as well prepared for her varied experiences in private practice as their sisters graduated during the years previous to the enactment of this special law.

The constant shifting of nurses is decidedly to the detriment of the patients, particularly after serious operations and during the course of obstetrical and puerperal care. The establishment of a forty-eight-hour week requires an increase in the number of available nurses beyond the number required under a regular eight-hour-day schedule.

The fact that such a restrictive law has been passed in California should arouse the attention of hospital superintendents throughout the country. No less interested are the members of the medical and surgical fraternity who depend for their best results upon the careful and efficient training of nurses. Inasmuch as the public has to pay the increased cost for the administration of hospitals, together with the additional expenditure necessary for securing extra nurses to take the place of the restricted pupil nurses, it may be said that it is vitally interested in the effects of legislation of this character.

The union principle does not recognize the possibility of personal service and self-sacrifice. It lowers the levels of nursing education and hampers the development of the nursing profession. The high ideals which the public has come to expect from nurses will be distinctly lowered by reducing the status of a trained nurse to that of an ordinary eight-hour day laborer.

While there may be some justification for the criticisms which have arisen regarding the treatment of pupil nurses in some hospitals of this country, the solution of the problem lies rather in the correction of the causes of such criticisms than to summarily legislate in such a way as to make it more difficult for hospitals to give proper care to their patrons. The legislation of a forty-eight-hour week for nurses decreases the quality of those to be graduated, increases the cost of nursing to the general public, and reduces nursing from a high plane of professional life to the category of ordinary unprofessional workers. A further development of the forty-eight-hour law as applying to all women would work a serious injustice upon professional women of all types now engaged in work connected with hospitals. The limit to forty-eight hours a week, the period of service of a housekeeper, a dietitian, or a woman interne would work a hardship upon the individuals, the institutions with which they are connected and the patrons whom they indirectly serve.

Manual of the Disease of the Eye

The Pharmacy Handbook. By F. W. CROSSLEY-HOLLAND, F.C.S., Pharmacist; Member of the Pharmaceutical Society of Great Britain, etc. Duodecimo; 224 pages. London: HENRY FROWDE and HODDER AND STOUGHTON, 1914. Price, \$2.60.

As the author says in his preface, this book is to present ready information matters which come within the purview of the practicing pharmacist. The subject matter is up-to-date, chapters being devoted to hormones, sera, vaccines and other newer therapeutic remedies. The book contains a great deal of useful information, including many tables for ready reference.

Practical Bandaging, Including Adhesive and Plaster-of-Paris Dressings. By ELDRIDGE L. ELIASON, A.B., M.D., Assistant Instructor in Surgery in the University of Pennsylvania Medical School; Assistant Surgeon, University of Pennsylvania Hospital, etc., etc. Octavo; 124 pages; 155 illustrations. Philadelphia and London: J. B. LIPPINCOTT COMPANY, 1914.

This is a brief presentation of the subject, written for students and nurses. The typical bandages are described and, in addition, methods found advantageous by the author. All the types of bandages that one need know are to be found succinctly described in Eliason's work. The illustrations are unusually clear and well chosen.

Progress in Surgery

A Résumé of Recent Literature.

Roentgenologic Observations on the Function of the Ileocecal Valve With Special Reference to the Causation of Ileac Stasis. J. T. CASE, Battle Creek. *Journal American Medical Association*, October 3, 1914.

Case has studied the question of the competency of the ileocecal valve and of its incompetency as a cause of intestinal troubles. He sums up the evidence for its normal competency as follows: "1. The ileocecal valve is almost universally present in vertebrate animals; and, at least, in the dog, pig and cat, the valve is competent to the enema, withstanding enormous distention of the colon by fluid and gas. 2. By means of a string passed through the alimentary canal traction may be made on the valve lips, producing temporary incompetency. 3. In about one-sixth of the three thousand persons, most of them constipated and all suffering from gastro-intestinal disturbances, the bismuth enema passed the ileocecal valve and filled the terminal ileum for varying distances. 4. The valve incompetency thus determined is a constant phenomenon in those cases. 5. Patients with incompetency of the ileocecal valve describe characteristic disagreeable symptoms apparently due to passage of the enema into the small intestine. 6. In the marked cases there is also observed a reflux of ingested bismuth from the colon back into the ileum. 7. The occurrence of the incompetency is, to a large degree at least, independent of the temperature or composition of the opaque enema. 8. The incompetent ileocecal valve may be restored to competency by a simple surgical procedure, the competency persisting in some cases at least a year and a half. 9. In operation on patients with incompetent ileocecal valve the small bowel is found filled with gas to a very disturbing degree. 10. It is possible in the operation of ileosigmoidostomy to construct an efficient artificial ileocecal valve which will successfully act as a barrier against reflux from the colon. 11. Definite deviations from the normal anatomic structure are found at operation on cases of ileocecal valve incompetency. 12. Post-mortem studies show the ileocecal valve to be competent in the great majority of cases."

End-Results in Cases of Gastric and Duodenal Ulcer. ELLIOTT P. JOSLIN, Boston. *Journal of the American Medical Association*, November 21, 1914.

Joslin traced 9 per cent of the cases of gastric and duodenal ulcer seen in private practice during the last sixteen years. A number of cases of gastric or duodenal ulcer were revealed that were not so originally diagnosed. The basis of the diagnosis was the history, with special attention to the symptoms of hyperacidity, pain, hemorrhage, perforation, the duration of the case and the after-history, including also the facts developed by surgery and the necropsy reports. The total number of cases was 234, and 213, or 91 per cent, were traced to date; 142 of the patients were men; 92 women. The average age of the men was 45 years when first seen, but the age at onset was 38 years and 8 months. The corresponding age in women was 36 years and four months and 30 years and 10 months at onset. The average duration of ulcer in cases still unrelieved is 11 years and the average duration before the cases reached the surgeons, 10 years. One hundred and thirty-one patients received only medical treatment; 39 per cent of these recovered; 42 per cent were relieved; 12 per cent were unrelieved and 7 per cent are dead. Of the patients operated on when medical treatment failed 52 per cent were traced and 40 per cent are well; 16 per cent are relieved, 12 per cent no better and 32 per cent dead. Deducting twelve deaths for which the surgeon should not be held responsible, there were 70 surgical cases; 47 per cent now well; 19 per cent relieved; 14 per cent unrelieved and 20 per cent dead. The combined medical and surgical results show at present 84 patients well, or 39 per cent; 68 patients, or 32 per cent relieved; 26 patients unrelieved and 35 patients, 16 per cent, dead. Twelve, or 6 per cent of the 213 patients traced, died of cancer, and of the 46 patients now dead the mortality from cancer was 26 per cent.

Value of Roentgenography in Diagnosis of Diseases of Larynx and Trachea. SAMUEL IGLAUER, Cincinnati. *Journal of the American Medical Association*, November 21, 1914.

Iglauer finds roentgenography particularly valuable for the study of the normal process of ossification of the larynx, which should be understood to appreciate the pathologic changes of the organ. He describes the technic, which is simple: "The patient sits on a chair or lies on a couch with the plate (8 by 10) in contact with the side of the neck and parallel to the median plane of the body. The patient is instructed to hold his breath and not to swallow during the exposure, which requires about six seconds. A profile picture of the larynx is thus obtained, with one side of the larynx superimposed on the other, but the side in contact with the plate comes out very distinctly. The roentgenogram of the normal larynx in tuberculosis, syphilis, cancer, fractures and other conditions are also described. While satisfactory diagnosis of diseases of the larynx and trachea can be made by the ordinary methods in most cases, the changes in the underlying and adjacent structures which are more or less involved with the mucosa are shown also by the Roentgen examination, and the data obtained are of great value in guiding operative procedures. In stenosis or distortion of the lumen or trachea the ray usually reveals the seat, the nature and extent of the lesion. Owing to the ease with which it is made, the ray has a special value in the examination of children and nervous patients."

Concerning Primary Resection of the Large Intestine. (*Zur Frage der Primären Dickdarmresektion.*) R. VON RAUCHENBICHLER, Muench. *Archiv fuer Klinische Chirurgie*, Vol. 105, Part I.

This paper is based upon a careful study of the immediate and final results of a series of thirty-seven cases of primary resection of the large intestine. Most of the operations were done for carcinoma of the bowel. The author's chief purpose is to demonstrate that, after all the factors are considered, primary resection, rather than the two and three-stage procedures, is the operation of choice. However, it is contraindicated in the presence of acute

ligation of the vessels and the injection of boiling water into the gland. The operations on the thyroid, however, do not always relieve exophthalmos and the Jaboulay operation, that is, a cervical sympathectomy of the superior, and sometimes of the middle ganglion for the sole purpose of reducing exophthalmos and securing a slight ptosis of the upper lids, has been performed in the Mayo clinic in cases in which the nervous symptoms are excessive and the exophthalmos extreme. "This operation can be done with novocain as a local anesthetic, but is preferably made with a general or combined anesthetic. Incisions are made in the lines of the natural creases in the neck opposite the bifurcation of the carotid. The sternomastoid is drawn outward and a blunt dissection is made down to the jugular and carotid veins, which are then drawn inward. The posterior sheath of fascia inclosing these vessels is opened that the vagus nerve may be kept under observation, since this nerve is bulbous above this point and might be confused with the sympathetic. Under normal conditions the sympathetic ganglion is one-eighth to one-fourth of an inch wide. Many branches lead from it on either side. The connecting branches are divided, the upper part of the ganglion torn off or cut and lower portions of the nerve cut or torn at the middle ganglion unless the middle ganglion is also removed. The wound is closed without drainage." The result is very good in securing the relaxation of the eyeball and slight ptosis of the upper lid with great general improvement. The ease with which it is performed and the excellent results which frequently follow its employment render it worthy of consideration in cases of extreme exophthalmos. In some cases where the sympathetic does not seem to occur as a ganglion and with fewer and larger communicating branches, the results are not so good, the operation seeming to be incomplete. In cases in which the vessels of both upper poles were ligated in addition to the sympathectomy, the primary results were good, but it is too early to announce a permanent cure.

The Orbital Approach to the Cavernous Sinus. HARRIS PEXTON MOSHER. *The Laryngoscope*, 1914.

Mosher's plan is to gain access to the cavernous sinus through the inner half of the orbital plate of the great wing of the sphenoid. Such an operation was performed on a patient after experiments on the cadaver, but the man died in a few days. An autopsy proved that the cavernous sinus had not been entered. The writer then began a series of investigations on the cadaver which resulted in his perfecting the following operation: The globe of the eye is removed and the orbit cleaned out. Then the ophthalmic artery is tied. The groove in which the superior maxillary nerve runs is found and the perosteum is then separated from the orbital surface of the great wing of the sphenoid. The opening is made with a chisel from the notch for the superior maxillary nerve to the outer end of the sphenoidal fissure. The opening is enlarged outward. The dura is then elevated, the sinus is exposed and a blunt-pointed knife is inserted, and carried forward until it is stopped by the sphenoid bone. Through this opening a small curette may be carried backward through the whole sinus.

Advances in the Treatment of Gonorrhea. S. W. MOOREHEAD. Philadelphia. *The Therapeutic Gazette*, October 15, 1914.

Moorehead advocates the use of the abortive treatment in cases seen early, as advocated by Ballenger—the sealing of a freshly prepared 5 per cent solution of argyrol in the urethra by means of collodion. This is repeated daily for five days, when in a large percentage of cases the disease will be found cured. In chronic gonorrhea the use of electrically heated sounds retained for thirty to sixty minutes at a temperature of 120° F. is recommended; also the use of the galvanic current to carry ions of silver, zinc or copper into the perurethral tissues. In cases seen too late to attempt the abortive treatment, 5 per cent argyrol or 2 per cent pro-targol hand injections four times daily, to be retained for five minutes, are advised. After the discharge have disappeared, one per cent zinc sulphate should be used.

The Surgical Treatment of Nephropotosis by Occlusion of the Perinephric Fascial Sac. (Capsular Occlusion). C. B. LOCKWOOD. London. *British Medical Journal*, October 3, 1914.

Lockwood criticizes the conventional operations for anchoring movable kidneys upon two grounds. 1. The very frequent recurrences. 2. Because they interfere with the normal mobility of the kidney. Lockwood believes that the normal mobility of the kidneys has an important influence upon their function. He then describes the anatomy of the perinephric fascial sac and shows that in nephropotosis the kidney prolapses, not because of dislocation of this sac, but because the sac has become too capacious. Based upon this principle, Lockwood has devised an operation in which the perinephric sac is shortened at its lower pole by appropriately placed sutures, permitting the kidney to remain in its normal position and at the same time retaining its mobility. Lockwood reports four cases in which the operation proved successful.

Experimental Studies Upon Extirpation of the Lung. (*Experimentelle Studien ueber die Lungenextirpation.*) K. KAWAMURA, Japan. *Deutsche Zeitschrift fuer Chirurgie*, Vol. 131, Parts 3 and 4.

The results of various methods of pneumectomy were analyzed and the final outcome determined, in a very interesting series of operations upon dogs. It was shown that the animals thrive indefinitely after removal of one lung, and even after amputation of part of the remaining lung. Young animals grow in an approximately normal manner after extirpation of one lung.

At the operation the chief difficulty lies in the closure of the bronchial stump. Willy Meyer's method (crushing, and inversion by several tiers of sutures) was found the most reliable, but cannot be applied when the main bronchus is short or in small animals. Kawamura reports satisfactory results in many cases in which he divided the pulmonary hilus between clamps, ligated the vessels and bronchi by sutures passed through their walls, and made a careful continuous suture of the chest-wall.

The positive pressure apparatus used at the operations was found more satisfactory than the negative pressure ones. There were no instances in which fluid collected in the thorax after removal of the lung. The remaining lung is already increased in size at the end of the operation. The increase reaches its maximum in thirty to sixty days after pneumectomy. The gap left by the removal of the lung is filled in, in the above mentioned time, by enlargement of the remaining lung, the displacement of the heart and diaphragm, elevation of the diaphragm, the sinking of the upper thoracic aperture and lateral chest wall. Pronounced scoliosis with convexity towards the operated side develops regularly.

The microscopic changes in the remaining lung were of considerable interest. Soon after the operation the picture was that of acute vesicular emphysema; this changed gradually to one of "vicarious" emphysema. Although hyperplasia of the lung was never observed, a true compensatory hypertrophy developed regularly. The vessels of the lung, at first dilated, subsequently proliferate.

All of Kawamura's observations indicate the feasibility of pneumectomy, from the viewpoints of technic and ultimate outlook.

A Study of Tuberculous Lesions in Infants and Young Children, Based on Post-Mortem Examinations. MARTHA WOLLSTEIN and FREDERICK H. BARTLETT. *American Journal of Diseases of Children*, November, 1914.

In 1320 post-mortem examinations made at the Babies' Hospital of New York City, 178 cases showed tuberculous lesions. In a very careful analysis of these latter cases the authors come to the following conclusions:

The largest number were of inhalation origin, as shown by the large percentage of cases in which the pulmonary lesions were the most advanced in the body. The absence of tuberculous lesions from the lungs in fourteen cases and the presence of tuberculous lesions in the bronchial nodes in seven of these seems to show that it is pos-

Cancer of the Tongue, Based Upon the Study of One Hundred Cases. JOS. C. BLOODGOOD, Baltimore. *Canadian Journal of Medicine and Surgery*, September, 1914.

This study has led to some remarkable conclusions. It has been demonstrated that the failure to cure when cancer of the tongue is fully developed is due chiefly to the neglect to remove the muscles of the floor of the mouth below the cancer. The high mortality after the operation is chiefly due to the removal of the floor of the mouth without removing at the same time a section of the lower jaw. If operated on very early, it is sufficient to remove the growth with a good margin of healthy tissue. In such cases there are almost 100 per cent of recoveries.

The author proceeds as follows: The glands of the neck are first removed and, after the operation, their connection with the floor of the mouth below the lesion is thoroughly burned with the cautery and the wound closed. Then the lesion in the tongue or floor of the mouth is attacked with the electro-cautery. The application of this is usually repeated two or more times, until everything is destroyed down to the area of the first cauterization from below. The healed skin flap of the first operation forms the floor of the mouth and prevents an oral fistula. In the author's most recent cases the operation has been done in three stages. When the author considers the cases (fourteen in all) personally operated on by him by these new methods in the past five years, he finds that there has been no post-operative mortality and so far but one patient is dead of recurrent carcinoma. When 86 other cases operated upon by methods previously used are considered, the advantage of the new technic is apparent, for formerly there was a post-operative mortality of 22 per cent. Bloodgood concludes as follows: "We have, therefore, apparently conquered the technic of operations for cancer of the tongue. Now, if we can educate men to come earlier, we shall probably conquer the disease."

Gastric Cancer in the Young. A Study of Sixteen Instances in Patients Under the Age of Thirty-one. FRANK SMITHIES, Chicago. *Journal of the American Medical Association*, November 21, 1914.

With an analysis of sixteen cases of gastric cancer in patients under the age of 31, Smithies reviews the statistics derived elsewhere and the recognized types of the disease. Six instances, some of them dubious, have been recorded in patients below the age of 10. In the second decade thirteen cases have been reported, but in five of these there were no reliable pathologic reports. In the thirteen cases in the third decade there were also a few, but in a few of these there was a seemingly malignant gastric disease. In his total group of 721 pathologically demonstrated gastric cancers from the Mayo Clinic and the Augustana Hospital, Chicago, the percentage of youthful cases was 2.2. There were nine females and seven males; the youngest aged 18, the oldest 30; the average age 27.8 years. In 12 per cent of the thirteen there was a family history of cancer. Apparently occupation was not a causal factor. Two types of histories are noted, the first including cases of a pernicious gastric affection of progressive course appeared with no preceding stomach ailment. In the second group there was a previous history of gastric complaints conforming to the type usually called peptic ulcer. Two of the sixteen cases fall into the first class and the average duration was 4.5 months. In the other fourteen the patients had been affected for an average of 4.8 years with some gastric malfunction which in its early stages had been roughly classed as dyspepsia. In five of the cases the syndrome was that of gastric ulcer. In four cases the so-called ulcer features were definite in some stage in the early period and in four other cases the symptoms were those of ulcer of an irregular type. In their remaining case there had been gall-stone attacks for four years and stones were found on laparotomy. The later stage of all in group two was typical of gastric malignancy. This period averaged 7.8 months, the shortest three weeks, the longest nearly three years. The malignant course in this group took nearly half again as much time on the average as that in group one. In six instances the appetite was poor and constipation was the rule in all. In the malignant stage there was marked loss of weight, in the early part of the dis-

ease, intermittent. Some degree of pain was noted in all cases, in two instances suggesting perforation. In the two cases of the first group it was never severe, but was continuous and generally aggravated by food and drink. In the other fourteen it came in spells or attacks in twelve. In seven instances it had a fairly definite relation to indigestion; in four instances, even after malignancy was shown, the food relief of pain persisted, but in ten it changed to food aggravation of pain. There was abdominal tenderness in all and tumor was palpated in six cases of the entire series. Eructations and pyrosis were commonly noted, and vomiting at some time in the course of the disease. Hemoglobin estimation in some cases averaged 66 per cent; and in ten blood was chemically demonstrated in the stools. In fifteen cases important facts were demonstrated by test-meals. Gastric motility was affected in eleven and dilatation of the stomach had occurred. Achylia appeared in none and free hydrochloric acid was absent in but one instance. Combined hydrochloric and acid salts averaged 18.1, ranging from 0 to 50. Lactic acid was demonstrated in six cases and altered blood chemically shown in gastric contents twelve times. The Boas-Oppler bacillus was recognized six times and yeasts and sarcinae were present in eight. The laparotomy findings showed the pylorus involved in five, the lesser curvature and some part of the gastric surface in nine; infiltration of the cardia in one and one case of general carcinoma. Lymph-nodes had been invaded in fourteen and secondary growth demonstrated in other organs in nine. In eight, medullary cancerous ulcers were present. In the others, adenocarcinoma of the common type. In five cases some form of resection was performed; in seven drainage operations to fit the case, and in four only exploration was possible. Nine patients died within one and one-quarter years following operation. To the other patients a lease of life from two to more than five years was granted. A tabulated summary of the cases accompanies the paper.

Bacteriology of Cholecystitis and Its Production by Injection of Streptococci. E. C. ROSENOW, Chicago. *Journal of the American Medical Association*, November 21, 1914.

Little attention has been given heretofore to the bacteriology of the tissues of the gall-bladder wall in cholecystitis. He gives an account of the bacteriologic findings in a case and of experimental work on producing cholecystitis in animals. The strains of streptococci producing cholecystitis are strikingly similar and resemble those from ulcers of the stomach. The lesions most commonly observed other than cholecystitis, when these streptococci are injected, especially in rabbits, are an ulcer of the stomach, hepatitis about the gall-bladder myositis, and myocarditis, arthritis, appendicitis, and colitis. He says: "The common presence of streptococci in the wall of the infected gall-bladder and in the center of gall-stones, often in pure culture, while absent from the bile, and their affinity for the gall-bladder in animals, are strong evidence that streptococci are the cause of cholecystitis in man far more frequently than is believed, and serves to explain the good results reported by some as following cholecystectomy in cases of myocarditis, arthritis, and other conditions."

The Surgical Treatment of Pericystitis. EUGENE FULLER, New York. *Medical Record*, October 3, 1914.

In the operation of seminal vesiculotomy, performed for the relief of the usual symptoms, mainly sexual, Fuller noted that the cystitis, which is frequently associated with such symptoms, cleared up after the operation. This led to cystoscopic examination of such bladders, and he found that the cystitis was confined to the base of the organ, in fact to that part of the bladder lying over the seminal vesicles. Fuller classifies these inflammations, therefore, as pericystitis. Further experience has shown Fuller that these inflammations are sometimes very extensive and occupy nearly the entire bladder mucosa. The important point that Fuller emphasizes is that the usual treatment of cystitis, viz., irrigations, drainage, etc., do no good in these cases; indeed they may even do harm. The only rational and effective treatment is seminal vesiculotomy. Fuller reports in detail three illustrated cases.

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